WILDLIFE REVIEW

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Except as indicated, abstracts are by William H. Stickel, editor.

NATURAL RESOURCES & CLIMATE

Dale, Tom, and Vernon Gill Carter. TOPSOIL AND CIVILIZATION. U. Okla. Press. 270 p., illus. 1955. $3.95. [From review by R. M. May, J. For. 54(5).]
Shows how land productivity has determined the rise and fall of civilizations and how conservation measures have affected the course of events. Conservation needs of the world today are considered. The situation is not hopeless if ALL the people understand what is necessary and really want a sound conservation program.

Dana, Samuel Trask. FOREST AND RANGE POLICY: ITS DEVELOPMENT IN THE UNITED STATES. McGraw-Hill Book Co., N. Y. 455 p. 1956. $6.50. [From long review by Henry Clepper, J. For. 54(5).]
Clepper considers this an excellent, objective work. "Each of the twelve chapters concludes with a summary and analysis of all that has gone before and provides a most useful compendium of the current status of federal, state, and private forest policies and how they evolved."

Lyons, Barrow. TOMORROW'S BIRTHRIGHT. Funk & Wagnalls, N. Y. 424 p. 1955. $5.00. [From review by Tom Dale, Soil Cons. 21(10).]
"The author designates this book as: 'A Political and Economic Interpretation of Our Natural Resources.' ...Though considerable space is devoted to discussing technological developments in resource use and some historical data on resource use and abuse are given, the main emphasis is on the economic and political problems involved, especially those of the 20th century in the United States... The entire field of resource use and conservation is covered, including soils, timber, wildlife, water, minerals, fuels, etc., though some resources are given more space than others. One of his main contentions is that proper development, use, and conservation of most natural resources will be determined largely by the turns taken in our political and economic systems as they evolve within the next generation. Obviously, the author thinks that more central government control of basic resources is needed. Yet, he tries to give a fair presentation, sometimes by quotes, of the case for those who think most resource development and use should be left in the hands of private enterprise... This is a book that most students of conservation will wish to read and keep as a reference, if only because of the wealth of factual material that has been assembled."

Ordway, Samuel H., Jr. PROSPERITY BEYOND TOMORROW. Ronald Press, N. Y. 208 p. 1955. $3.00. [From review by A. B. Meyer, Am. Forests 62(4).]
The world can look forward to several decades of great material prosperity and increasing amounts of leisure time. Human populations will grow and natural resources will be exploited at a rate that cannot be sustained indefinitely at the present rate of use. The period of prosperity and leisure affords the best and probably the last chance to develop an ethic of resource use. The circumstances "will be ripe to gain public support and participation in activities and programs directed toward conservation of the renewable resources. Such participation would in turn make apparent the necessity of controlling populations within the capacity of the resources to support populations."

Parson, Ruben L. (E. Tenn. State Coll.) CONSERVING AMERICAN RESOURCES. Prentice-Hall, Inc., Englewood Cliffs, N. J. vii + 550 p., 214 figs. 1956. $8.65; text ed. $6.50.
A semipopular, informally written book intended for public reading or college class use. It covers all resources: water, soils, forests, grasslands, wildlife, recreational areas, wilderness, marine resources, and minerals. The author's approach is progressive, positive, and relatively optimistic. Covering so broad a field, the author has not included many concrete examples or proofs, except for those exemplified in the numerous sketches, photographs, and maps. Rather, the book is like a personal lecture on principles and generalizations. Few if any outright errors were detected in glancing through the volume, but the reviewer did not always agree with the author's emphasis and interpretations, and he did not appreciate the overly colorful expressions that occasionally interrupted the train of thought. Certainly, however, the book is a modern, dynamic presentation that brings together much information from many sources and it is documented. Wildlifers will appreciate the fact that wildlife is

alloted 2 chapters and that natural areas, recreation, and aesthetic values are given due attention. The need of conserving nonrenewable resources, on the other hand, seems underrated. Human population problems are given only passing notice and the author does not seem to be worried about them. The back of the book contains numerous references, tips to teachers, suggestions for projects, and information on where to get a wide variety of films and printed material.

Sax, Karl. STANDING ROOM ONLY / THE CHALLENGE OF OVERPOPULATION. Beacon Press, Boston. 206 p. 1955. $3.00. [From review by P. S. Henshaw, Sci. Monthly 82(5).]

"This is a hard-hitting book set forth in easy reading style and it is rapidly paced. It deals with the factors that have led to the present unprecedented growth of world population, considered in relation to agriculture, industry, and medicine. It draws from a prodigious background of statistical information and gives only the figures needed to make pertinent points. Tables and graphs are easy to comprehend, and each seems to pack an unusually stiff punch... The final conclusion is that in the future, as in the past, population growth will be controlled by wars, famine, and disease unless birth rates in all parts of the world are soon adjusted to moderate levels."

SOILS

Goldston, E. F., and others. SOIL SURVEY OF MACON COUNTY, NORTH CAROLINA. US Soil Cons. Serv., Ser. 1944, no. 6. 1-124 p., illus. + large folding maps. Apr. 1956. $1.75 from Supt. Documents.

Tedrow, N. P., and others. SOIL SURVEY OF ALLEGANY COUNTY, NEW YORK. US Soil Cons. Serv., Ser. 1942, no. 12. 1-141 p., illus. + large folding maps. Feb. 1956. Price not stated. Order from Supt. Documents.

CONSERVATION EDUCATION

Frost, Herbert Hamilton. A PLAN FOR THE USE OF FACTUAL AND VISUAL MATERIAL IN TEACHING THE VERTEBRATE FAUNA OF IDAHO WITH EMPHASIS ON CONSERVATION. Ph. D. thesis, Cornell U. 250 p. 1955. [From abstract in Dissertation Abstracts 16(2).]

Schultz, Ida Beth. A WAY OF DEVELOPING CHILDREN'S UNDERSTANDING OF ECOLOGY. Ph. D. thesis, U. Fla. 169 p. 1955. [From long abstract in Dissertation Abstracts 15(12).]

The author worked with children and teachers in endeavor to find good approaches and tested a sample guide to elementary study of a community. She reports these studies and makes suggestions for better training of teachers for teaching the interrelationships of natural forces and their effects on man.

BIBLIOGRAPHIES, DIRECTORIES, BIOGRAPHY, HISTORY

Aldous, Isabel D., Elizabeth K. Abolin, Ruth Keefe, and Lola T. Dees. FISHERY PUBLICATION INDEX 1920-54. US F&WS, Cir. 36. x + 254 p. 1955. $1.50 (paper) from Supt. Documents.

Cites titles, listed by series, of all fishery publications of Bur. Fisheries and F&WS for period covered, and provides author and subject indexes. Although the great bulk of entries is on fishes and fisheries, numerous titles pertain to seals and a few to whales, frogs, alligators, turtles, algae, and other subjects.

COOPERATIVE WILDLIFE RESEARCH UNIT PUBLICATIONS, 1955. US F&WS. 1-18 p., proc. Feb. 1956.

Lists wildlife and fisheries publications by author under unit.

BIBLIOGRAPHIES, DIRECTORIES, BIOGRAPHY, HISTORY--Continued

Kessel, Edward L., editor. A CENTURY OF PROGRESS IN THE NATURAL SCIENCES 1853-1953. Calif. Acad. Sci. x + 807 p., illus. 1955. $10.00.

Forty contributions by outstanding experts discuss the modern development and history of as many branches of natural history, with emphasis on systematic zoology and botany. Groups of plants and insects receive several chapters. Perhaps the chapters of chief interest to readers of WR are: The contribution of natural history to human progress, by G. F. Ferris. Herpetology, by K. P. Schmidt. Ornithology, by C. G. Sibley. Mammalogy in North America, by W. J. Hamilton, Jr. Plant geography, by Ronald Good. Animal geography, by K. P. Schmidt. The conservation of wildlife, by A. S. Leopold. A long chapter by Joseph Ewan tells of the early naturalists in Calif. and formation of the Calif. Acad. Sci. Some chapters are not merely historical but afford critical analyses of subject matter and systems in their field and have extensive bibliographies.

Morgan, Murray. THE LAST WILDERNESS. Viking Press, N. Y. xi + 275 p., 15 photos. 1955. $3.95.

"The Last Wilderness" is the Olympic Peninsula of Wash. Morgan's book is an entertaining account of events from exploration to the present, including the struggles over the National Forest and National Park. Interesting characters and exciting anecdotes are emphasized. This causes some lack of continuity, but the reader gets a vivid picture of conditions and activities at different periods. Morgan manages to give a sympathetic view of the lumbermen and the lumberjacks, of the I.W.W. and its opponents, of the people who felt that resources should be exploited and those who favored national forest policy and national park formation. It is clear, however, that he takes as much satisfaction in telling about the tree farms, fish ladders, and National Park of today as he does in telling about the wild violence and fantastic characters of earlier times. The book is indexed but not documented.

REPORTS ON WATER RESOURCES; AN ANNOTATED BIBLIOGRAPHY OF RECENT OFFICIAL REPORTS OF STATE AGENCIES. Council of State Governments, Chicago. Ser. BX 298. 20 p. 1955. $1.00. [From Monthly Checklist of State Publ. 47(1).]

Van Doren, Mark, editor. TRAVELS OF WILLIAM BARTRAM. Dover Publ. Inc., N. Y. 414 p., illus. 1955. $1.95, paper; $3.95, cloth. [From review by O. L. Austin, Jr., Bird-Banding 26(4).]

"An unabridged reprint of this rare classic, first published in 1791... Bartram was a well-rounded naturalist, keenly interested in all living things, and he had a nice gift for description. I find particularly intriguing his casual, matter-of-fact, yet accurate and ample comments on the wildlife he encountered. It is hard to believe how abundant, only 175 years ago, were the birds we know only as rarities today." Travels described were in what is now se. U. S.

Various authors. LEWIS AND CLARK ANNIVERSARY NUMBER. J. Wash. Acad. Sci. 44(11): 333-373, illus. Nov. 1954.

Lewis and Clark's background for exploration, by J. E. Bakeless. Cartographic and geographic activities of the Lewis and Clark expedition, by H. R. Friis. Botanical contributions of the Lewis and Clark expedition, by V. E. Rudd. Zoological contributions of the Lewis and Clark expedition, by H. W. Setzer. The contributions of Lewis and Clark to ethnography, by V. E. Ray and N. O. Lurie. William Clark: Pioneer museum man, by J. F. McDermott.

PLANTS--GENERAL, ECOLOGY, TECHNIQUES

Daubenmire, R. (State Coll. Wash.) CLIMATE AS A DETERMINANT OF VEGETATION DISTRIBUTION IN EASTERN WASHINGTON AND NORTHERN IDAHO. Ecol. Monog. 26(2): 131-154, 14 figs. Apr. 1956.

An important, detailed paper that reviews and analyzes the difficulties of correlating distribution of vegetation with climatic areas as defined by various schemes of classifying climates. In particular, systems of Köppen, Thornthwaite, and Swain were tried and found lacking. Some success was achieved in discovering features of climate that correlated with vegetation of the area studied. "A

rather high degree of success was achieved largely through plotting mean monthly temperatures against median monthly precipitation. In the main, each vegetation type differs from its neighbors in the degree of summer drouth, except at the wet end of the climatic gradient where heat deficiency in summer becomes decisive. All the positive results are in close accord with other ecologic data that are accumulating, hence suggest that the results have fundamental significance. Discussion concerns the inherent weaknesses of universal climatic classifications insofar as phytogeography is concerned, the inadequacies of the basic climatic data, the relative significance of means, media, and extreme values, and the increasing possibility for the recognition of the same landscape units by climatologists, pedologists, and biologists."

Gates, Dillard H., L. A. Stoddart, and C. Wayne Cook. (Utah Agr. Exp. Sta., Logan.) SOIL AS A FACTOR INFLUENCING PLANT DISTRIBUTION ON SALT-DESERTS OF UTAH. Ecol. Monog. 26(2): 155-175, 6 figs. Apr. 1956.

Study of soil characteristics in areas dominated by sagebrush, winterfat, shadscale, Nuttall saltbush, or greasewood. "The five species studied were found to be unreliable as indicators of specific soil characteristics but, in some instances, could be used for imposing upper limits and estimating averages to be expected for certain soil factors."

Poore, M. E. D. (Nat. Conservancy, 12 Hope Terrace, Edinburgh, Scot.) THE USE OF PHYTOSOCIOLOGICAL METHODS IN ECOLOGICAL INVESTIGATIONS. IV. GENERAL DISCUSSION OF PHYTOSOCIOLOGICAL PROBLEMS. J. Ecol. 44(1): 28-50, 1 fig. Jan. 1956.

PLANTS--FLORAS, COMMUNITIES, TAXONOMY

Dale, Edward E., Jr. (Texas Christian U.) A PRELIMINARY SURVEY OF THE FLORA OF THE ARBUCKLE MOUNTAINS, OKLAHOMA. Texas J. Sci. 8(1): 41-73, map. Mar. 1956.

Brief discussion of area and nonannotated list of vascular plants.

Hitchcock, C. Leo, Arthur Cronquist, Marion Ownbey, and J. W. Thompson. VASCULAR PLANTS OF THE PACIFIC NORTHWEST. PART V. COMPOSITAE, by Arthur Cronquist. U. of Wash. Press, Seattle 5. 343 p., illus. 1955. $7.50. [From A.I.B.S. Bul. 6(2).]

"The University of Washington Press and the four authors have undertaken a most ambitious project in the preparation and publication of Vascular Plants of the Pacific Northwest. Although the fifth volume, on the Compositae, is the first to appear, when the series is complete, all ferns, fern-related, and seed-bearing plants of Washington, Northern Oregon, Idaho north of the Snake River plains, the mountainous western part of Montana, and southern British Columbia will have been covered. Approximately 4000 species will be described eventually. Each species is illustrated and the text lists recent taxonomic revisions, widely accepted common names, data on distribution, habitat and flowering periods, complete synonymy and complete keys. The illustrations, all line drawings, have been well executed by John H. Rumely."

Prescott, G. W. HOW TO KNOW THE FRESH-WATER ALGAE. AN ILLUSTRATED KEY FOR IDENTIFYING THE MORE COMMON FRESH-WATER ALGAE TO GENUS, WITH HUNDREDS OF SPECIES NAMED AND PICTURED AND WITH NUMEROUS AIDS FOR THEIR STUDY. Pictured-Key Nature Series, Wm. C. Brown Co., Dubuque, Iowa. vi + 211 p., illus. 1954. $2.75, cloth; $2.00, spiral-bound, paper. [From review by M. S. Doty, Quart. Rev. Biol. 30(3).]

"...would be of great value to students of freshwater algae anywhere..." Introduction of 20 p. covers collecting, preserving, classification, ecology, etc. "The body and meat of the text follows as an extensively illustrated, practical key to the genera of freshwater algae... There is no doubt that the author is the most active authority on freshwater algal floristics today. This is shown in many places... The usefulness of this volume is greatly enhanced by...the Index and Pictured-Glossary. In it not only are page references given to names, but terms are defined and illustrated."

PLANTS--FLORAS, COMMUNITIES, TAXONOMY--Continued

REGISTER OF VEGETATION RESEARCH ISSUED. J. For. 54(5): 343. May 1956.
"The Committee for Vegetation Study of the Ecological Society of America has recently issued a Register of Vegetation Research. Supplements to this first Register will be published as often as sufficient information is collected, probably at least once every two years. Questionnaires for such a supplement are currently being distributed. Anyone working in the indicated field is invited to fill out this questionnaire. In general, all projects concerned with the study of naturally occurring, macroscopic plant communities will be included. Research concerned entirely with artificial communities, applied work, life history studies of individual species, and work primarily concerned with the environment are excluded. Geographically, the Register includes only studies of North American vegetation. Copies of the current Register, priced at $1, and questionnaire forms may be secured from Prof. Grant Cottam, Birge Hall, University of Wisconsin, Madison 6, Wis." Copied completely.

Schofield, W. B., and W. J. Cody. (Can. Dept. Agr., Ottawa.) BOTANICAL INVESTIGATIONS ON COASTAL SOUTHERN CORNWALLIS ISLAND, FRANKLIN DISTRICT, N. W. T. Can. Field-Nat. 69(3): 116-128, 2 maps. July-Sept. 1955.
Discusses major habitats and presents annotated list that emphasizes habitats and locality records of species. Variation and taxonomy are mentioned for some species.

Westveld, Marinus, committee chairman. NATURAL FOREST VEGETATION ZONES OF NEW ENGLAND. J. For. 54(5): 332-338, map. May 1956.
Discusses and maps the 6 main forest-type zones. Soils, successions, and variations are considered.

WILDLIFE--NEW GAME SERIES

THE CONNECTICUT WILDLIFE CONSERVATION BULLETIN. Published 6 times a year by Conn. Board of Fisheries & Game, Hartford. Vol. 1, no. 1, 8 p., illus., Sept.-Oct. 1955. 50¢ a year.
The first 4 issues of this journal each have 8 pages. Pages are 8.5 x 11" and have 3 columns of good letterpress printing. Articles and illustrations emphasize conservation education, information about local animals and their management needs, and activities and programs of the department. Several items of interest were noted in the first 4 issues: Conn. wildlife men are concerned about San Juan rabbits, which are rumored to have been released illegally in Mass. Conn. is undertaking a mallard establishment program similar to that of N. Y. Efforts to have the deer made a game animal in Conn. have failed; deer remain an unprotected agricultural pest. Sales of hunting licenses have increased but little in Conn. in last 10 years; they have not increased in proportion to human population. Beaver were extinct in state for about 75 years but are now well established; control consists of redistribution, as trapping for fur is not permitted. Ruffed grouse have become relatively scarce owing to loss and change of habitat; management of grouse habitat is being undertaken. Tidal marshes of Conn. have been reduced from some 24 sq. mi. in 1941 to about 15 sq. mi. in 1954. Deliberate filling with spoil from dredging is largely responsible. As a result, important wildlife habitat and hunting areas are being lost rapidly. Canada geese nest several places in Conn. The animals called "jack rabbits" in Conn. are European hares; they now are scattered over most of state. The opossum was practically unknown in Conn. 50 years ago. Now it is generally distributed and is fairly common, at least locally.

MASSACHUSETTS WILDLIFE. Published 6 times a year by Mass. Div. of Fisheries and Game (Field Headquarters, Westboro, Mass.). Vol. 7, no. 1, 18 p., illus., Jan.-Feb. 1956.
"With this issue, MASSACHUSETTS WILDLIFE joins the family of state conservation publications printed in magazine format." The new journal is 9 x 6 in. in size, is well illustrated, and is printed by letterpress on glazed paper. Contents of the first issue are popular and educational. The series starts as vol. 7 because it previously appeared as a processed leaflet.

WILDLIFE--BIOTAS, ECOLOGY, NATURAL HISTORY

EKOLOGIA POLSKA. Published quarterly. Tom I, 1953, 468 p., illus. Tom II, 1954, 484 p., illus. Available from: Polish Academy of Sciences, Institute of Ecology, Varsovie, rue Nowy Swiat 72, Poland.

This journal, similar to our "Ecology" in content, apparently is available to American institutions by purchase or suitable exchange arrangements. Papers have good summaries (and titles) in western languages, mostly English, some German, fewer French. The first 2 volumes contain 3 papers on birds: 1 on food of Buteo buteo, 1 on formation of heron flocks, and 1 on influence of afforested regions on the avifauna of open areas and on adaptation of bird populations. It is shown in this paper that birds are fewest in species and individuals at wood margins; various corollary points are discussed. Several papers treat limnology and several others are devoted to soil microbiology. Papers also take up ecology of aphid populations, forest ants, tick populations, water mites, forest spiders, leeches, forest mosquitoes, caddis flies, Thysanoptera, crustacea, plant sociology, forest associations, and factors in the development of certain invertebrates.

Gillham, Mary E. (U. of Exeter, Eng.) ECOLOGY OF THE PEMBROKESHIRE ISLANDS. IV. EFFECTS OF TREADING AND BURROWING BY BIRDS AND MAMMALS. J. Ecol. 44(1): 51-82, 8 figs. Jan. 1956.

Good study of effect on vegetation of burrowing, trampling and manuring by wild and domestic animals. Chief burrowers were rabbits and various sea birds. Responses of many kinds of plants are discussed.

GREENLAND FISH AND WILDLIFE GUIDE. Caribou Press, Bronxville, N. Y. 1954. 60¢. [From Aud. Mag. 57(5).]

Lane, Frank W. NATURE PARADE. Sheridan House, N. Y. 333 p., illus. 1954. $5.00. [From review by Monica de la Salle, Aud. Mag. 57(5).]

"Food, toilet, sleep, leadership, strength, war, and doctoring in mammals, fish, birds, and insects are some of the subjects covered by chapter titles... They give, however, but a slight inkling of the mass of 'believe it or not' information to be found on any page. ...substantiated by bibliographical references. A section devoted to locomotion is of special value for its statistical table of speeds, in creatures all the way from caterpillars to men."

Schmidt, Karl P. (Chicago Nat. Hist. Mus., Chi. 5, Ill.) ANIMAL GEOGRAPHY. In A Century of Progress in the Natural Sciences 1853-1953. Calif. Acad. Sci. p. 767-794, 5 figs. 1955.

Informative and critical history of zoogeography. Sections take up permanence of continents, land-bridge speculations, isostasy, continental drift, "Climate and Evolution," ecology and distribution, island life, water areas, isolation and speciation.

WILDLIFE—NATURAL AREAS & REFUGES

Brainerd, John W., editor. NATURAL AREAS FOR SCHOOLS. Nature Conservancy (4200 22nd St. NE, Wash. 18, D. C.) Inf. Bul. no. 19. 1-10 p. [Apr. 1956.]

Contains good ideas from many people on values and uses of natural or seminatural areas that belong to or are available to elementary and high schools.

Drury, Aubrey, editor. POINT LOBOS RESERVE: INTERPRETATION OF A PRIMITIVE LANDSCAPE. Calif. Div. Beaches & Parks, Sacramento. 96 p. 1955. $1.00. [From review in Nat. Cons. News. 6(1).]

"A well documented 'case history' of the preservation of a natural area..." This area on the Calif. coast became a state park in 1933. "...specialists in many fields were called in to observe the area and record its character. They mapped the topography, analyzed the geological structure, and plotted the vegetative cover. 300 species of plants, 178 vertebrate animals, and 88 marine invertebrates were listed. The experts studied the normal balance of conditions favorable to maintaining the plant and animal species and tried to relate this balance to human use of the area... The plan is one of moderation. Only trails lead into the finer and more perishable areas... The present book about Point Lobos interprets the work of specialists who studied the area. There are chapters on various groups of animals and plants, geology, history, landscape, protection of the primitive, and the master plan. Persons attempting to preserve natural areas anywhere will find much information of value."

Olson, Sigurd F. THE SINGING WILDERNESS. Alfred A. Knopf, N. Y. ix + 245 p., with chapter-heading sketches by Francis Lee Jaques. 1956. $4.00.

Olson is a leader in wilderness preservation and a trained ecologist. He enjoys the outdoors with the intensity of an expert woodsman and skilled trout fisherman. He loves nature with an esthetic fervor that verges on the mystic. These facets of his character form the thread and color of his book. If you enjoy reading works of nature appreciation by men such as Thoreau and Muir, you should enjoy this book. Basically, the book is a series of sketches about the Quetico-Superior country of n. Minn. as the author has experienced it throughout the year. The 33 chapters center around such subjects as canoeing in the wilderness, pine knots, campfires, loons, trout fishing, travels by ski, and timber wolves. The real body of the book, however, is the author's emotional reactions to these things, and the memories they evoke. Each chapter is a poem in prose rather than a guide to wilderness living--a sharing of feeling with those of like spirit rather than a report of adventures. The following quotation conveys the tenor of the book and explains its title: "There are many types of music, each one different from the rest: a pack of coyotes and the wild, beautiful sound of them as they tune up under the moon; the song of a white-throated sparrow, its one clear note so closely associated with trout streams that whenever I hear one, I see a sunset-tinted pool and feel the water around my boots. The groaning and cracking of forming ice on the lakes, the swish of skis or snowshoes in dry snow--wilderness music, all of it, music for Indians and for those who have ears to hear."

U. S. Fish & Wildlife Service. REFUGE LEAFLETS.

Three series of these leaflets are being issued for use of visitors to refuges. General series begins with no. 1, bird list series with 101, historical series with 201. The present listing is intended to bring up to date, through April 1956, the list of earlier numbers presented in WR 78: 11-12. No addition to the historical series has appeared.

General Series.--Each provides general information about a refuge and has a simple map and sketches. Printed. Order from Supt. Documents.

RL	10.	Horicon	Wis.	1955	4 p.	5¢
	11.	Seney	Mich.	1955	4 p.	5¢
	12.	National Bison Range	Mont.	1955	4 p.	5¢

Bird List Series.--Each has a little information about the refuge and contains a list of its birds, with indications of seasonal occurrence and relative abundance. Each consists of 3-4 processed pages.

RL	137.	Sabine	La.	1955
	138.	Tamarac	Minn.	"
	139.	Bear River	Utah	"
	140.	Long Lake	N. D.	"
	141.	Necedah	Wis.	"
	142.	Upper Mississippi River	Minn.-Wis.-Ia.-Ill.	"
	143.	Malheur	Ore.	"
	144.	Moosehorn	Me.	"
	145.	Wheeler	Ala.	"
	146.	Sacramento	Calif.	"
	147.	Blackwater	Md.	"
	148.	Aleutian Islands	Alaska	"
	149.	Tennessee	Tenn.	"
	150.	Lower Florida Keys	Fla.	"
	151.	Kodiak	Alaska	"
	152.	Medicine Lake	Mont.	"
	153.	Big Lake	Ark.	1956
	154.	Savannah	Ga.-S. C.	"
	155.	Squaw Creek	Mo.	"
	156.	Ruby Lake	Nev.	"
	157.	Rice Lake	Minn.	"
	158.	Valentine	Nebr.	"
	159.	Imperial	Ariz.-Calif.	"
	160.	Presquile	Va.	"

WILDLIFE--NATURE PROTECTION & RARE & EXTINCT SPECIES

Burton, Maurice. LIVING FOSSILS. Thames & Hudson, London & N. Y. [Vanguard Press, N. Y.] xiv + 282 p., illus. 1954. $5.00. [From review by L. J. and Margery Milne, Quart. Rev. Biol. 30(3).]

Deals with many isolated and "ancient" types of animals, including numerous kinds of birds and mammals, on world basis. "Most of the discussion is based upon the supposed geography of land masses in early geologic time... The final chapters inquire into the possible causes of extinction and those underlying survival, and cite the information in the literature on monsters and mystery animals. The whole makes absorbing reading. Ten pages packed with references would have made the book far more valuable to the scientist..." Semipopular, the book "could make the basis for a fascinating series of seminar talks at the graduate level."

WILDLIFE--MORPHOLOGY, PHYSIOLOGY, BEHAVIOR, MIGRATION

Irving, Laurence, and John Krog. (Arctic Health Res. Center, Anchorage, Alaska.) TEMPERATURE OF SKIN IN THE ARCTIC AS A REGULATOR OF HEAT. J. Applied Physiol. 7(4): 355-364. Jan. 1955. [From J. Mamm. 37(1).]

Kalmus, H. THE SUN NAVIGATION OF ANIMALS. Sci. Am. 191(4): 74-78. 1954. [From Auk 73(1).]

"Popular account." Should be useful to those who wish to know something about this dominant new explanation of much bird navigation but do not require the details supplied by technical articles or Matthews' book (WR 83: 41).

Southern, H. N. NOCTURNAL ANIMALS. Sci. Am. 193(4): 88-98. 1955. [From Auk 73(1).]

"Popular account of the adaptations of animals chiefly the Tawny Owl (Strix aluco), to a nocturnal existence. Also included is information on size of territory, prey items, and population density. The Tawny Owl could be observed by illuminating the woods at night by means of an automobile light screened, like a darkroom lamp, to give visible red rays to which it was blind. It was found that badgers and foxes were also blind to this red light. This account was based on researches carried out in England at Wytham woods."

WILDLIFE--EFFECTS OF CHEMICALS, WEATHER, CARS, ETC.

Anon. FLOOD EFFECT ON CONN. WILDLIFE. Conn. Wildl. Cons. Bul. 1(2): 1, 4, 7. Nov.-Dec. 1955.

Concise picture of results of heavy floods of late 1955 on fish and game habitats. "Where fast-moving streams flooded narrow valleys, the entire habitat was destroyed... Where these streams flooded broad, flat valleys, the damage was not so complete. In areas where flood waters stood for many days, the herbaceous plants, many of them of great game-food value, were drowned out. Shrub growth shows better survival; however, the plants are still covered with a silt deposit. Their fruits...were stripped from the branches or rotted. Almost the entire area is still covered with up to many inches of silt and mud. The silt has seriously reduced the amount of rooted aquatic vegetation in the marshes... One of the first plants to reappear has been the smartweed. In some areas this is still the dominant plant. Muskrat and waterfowl are making use of these areas. Raccoon are common...due undoubtedly to the presence of a frog population. Lack of fox sign indicates that shrews and mice may have been completely eliminated... Until plants and animals used as food by other wildlife become re-established, flood zones cannot be expected to have much in the way of resident wildlife populations."

Bostick, Vernon. IS DDT CONVERTING SOME NATIONAL FORESTS INTO BIOLOGICAL DESERTS? Nat. Mag. 49(4): 202-204, 219, 3 figs. Apr. 1956.

Describes effect of aerial spraying for spruce budworm in Carson Natl. For., N. M. According to author, almost all fish-food organisms and other invertebrates were killed with consequent loss of food for all insectivorous animals. In reply to statements that we must choose between fish food and trees, the author submits evidence that the spraying program was needless and unjustified.

Post, George. (Wyo. Game Comm.) DISASTER STRIKES WHEN PIPES BREAK. Wyo. Wildl. 20(3): 22-24, 6 figs. Mar. 1956.

A 20-inch oil line broke in Wyo. and allowed a stream of oil 10" deep and 12-14' wide to flow into the Platte River. Attempts to restrain and burn the oil failed, although some 1,500 barrels of it were burned. Stretches of the river were covered with oil. Many aquatic organisms, including minnows, were killed. Various mammals became oiled. "There is one cure for this type of pollution, and that remedy is the installation of pressure activated valves at all pumping stations on lines carrying fluids which may cause damage... Why not make it compulsory for such valves to be placed at all pumping stations?"

Webb, W. L., E. M. Rosasco, and S. V. R. Simkins. THE EFFECT OF CHEMICAL DEBARKING ON FOREST WILDLIFE. In CHEMICAL DEBARKING OF SOME PULPWOOD SPECIES, by Hugh Wilcox and others. State U. N. Y. Coll. For. (Syracuse), Tech. Publ. 77. x + 43 p., 31 figs. 1956. 60¢.

The section on wildlife occupies pages 35-41 in this definitive monograph on techniques and evaluation of debarking. The wildlife portion summarizes knowledge of and reports studies on mortality of animals from debarking, toxicity of arsenical preparations, arsenic content of treated trees, attractiveness of sodium arsenite, and ways of reducing mortality of animals. Deaths of animals were found to be few. Most if not all deaths probably resulted from arsenite that had been spilled. Repellents (creosote derivatives) are being added to debarking chemicals by several manufacturers. A dull, dark dye should also be added to reduce possible attraction of animals. Results of debarking operations are expected to improve wildlife habitat to an extent that will far outweigh the occasional deaths that may occur from arsenite.

WILDLIFE--POPULATIONS & FLUCTUATIONS

Chitty, Dennis. (Bur. Anim. Pop., Oxford, Eng.) ADVERSE EFFECTS OF POPULATION DENSITY UPON THE VIABILITY OF LATER GENERATIONS. p. 57-67. In "The Numbers of Man and Animals," J. B. Cragg and N. W. Pirie, eds. 152 p. Oliver & Boyd, Edinburgh. 1955.

Summary: "1. It is frequently claimed that the effect of physical factors upon the death-rate is mainly independent of population density. The assumption underlying this belief is that populations are equally resistant to the forces of mortality at all levels of abundance. 2. If this assumption is false then the abundance of certain species may be limited primarily through a change in susceptibility, and the direct causes of death may vary according to local circumstances. 3. This hypothesis fits the field evidence for Microtus ssp. and is being tested experimentally. The peculiarities of a cycle in numbers cannot be attributed to depletion of the food supply." In discussion section that follows paper, Chitty reports experimental results on physiological changes that accompanied high density in field and social contacts in laboratory populations of Microtus.

Koskimies, Jukka. ULTIMATE CAUSES OF CYCLIC FLUCTUATIONS IN NUMBERS IN ANIMAL POPULATIONS. Papers on Game Res. (Helsinki) 15. 1-29 p. 1955.

Important paper on why cyclic behavior arose. The basic idea is that many herbivorous northern animals have so much reproductive power that they could multiply and destroy their food supply within a few years. Northern vegetation is slow growing and easily injured. Numerous examples show that animals can destroy their habitats. In the long run, it is advantageous to a species to crash before habitat destruction occurs. The ability to do so was developed by natural selection. Methods of timing crashes presumably were selected for in accordance with rapidity of habitat destruction in a given region. Since various lunar cycles provided periods of suitable length, different ones were selected for in different regions. [For citation of chief paper on lunar cycle hypothesis see WR 83: 8.] Koskimies provides much evidence for his theory and discusses much work by other writers, including many North Americans. He shows how the theory coordinates with population regulation through stress phenomena and consequent reduction of reproduction.

WILDLIFE--BIOMETRICS

Panse, V. G. ESTIMATION OF CROP YIELDS. Food & Agr. Organization, United Nations, Rome. Publ. 4D/6-3500. ii + 61 p. July 1954. 50¢ from Columbia U. Press, Internat. Documents Serv., 2960 Broadway, N. Y. 27, N. Y.

Material discussed has application to wildlife research. Subjects covered are: current methods of estimating crop yields, technique of objective measurement of yield by crop cutting, general considerations in design of crop-cutting surveys, some technical considerations, and field work and personnel.--V. Schultz.

Robinette, W. L., D. A. Jones, J. S. Gashwiler, and C. M. Aldous. (US F&WS, Salt Lake City, Utah.) FURTHER ANALYSIS OF METHODS FOR CENSUSING WINTER-LOST DEER. J. Wildl. Mgt. 20(1): 75-78. Jan. 1956.

Experimental analysis of strip census methods. Testing of several census methods on areas containing a known population of either dead deer or burlap sacks to simulate dead deer revealed that King's, Kelker's and the Lincoln Index methods gave acceptable results, whereas, Hayne's and Webb's gave results considerably in excess of the actual. Added analysis, however, revealed average observational angles (between the line of travel and line of sight) significantly in excess of the theoretical (32°42'). It is possible that in different vegetative types or with different censusers, the average sighting angle might vary and if so results from the two census methods employing sight distances (King's and Hayne's) could also vary. Computed population values increase as the sighting angles increase. Because of this possible source of error from King's method the writers recommend Kelker's belt transect method, covering a strip of predetermined width, and the Lincoln Index, in the order named, as the safest methods for censusing dead deer.--W. L. Robinette.

Stearman, Roebert L. (Johns Hopkins School Hygiene, Balt. 5, Md.) COMMENTS ON THE USE OF STATISTICS. A.I.B.S. Bul. 5(5): 16-17. Oct. 1955.

Discusses whether statistics should be used and when and how they should be used. "Common sense is the best approach to the use of statistical tools. They are no wonder tool nor are they something to be feared. They are almost essential in some problems but need not be used on every set of data... Statistical techniques are no substitute for good experimental technique nor are they a substitute for sound professional judgement... You probably won't need a statistician when dealing with the elementary (statistical) designs in experiments, however, if you need one, it is to your advantage to consult him in the planning stage of your work and not after the experiment is completed." --R. L. Stearman.

WILDLIFE--TECHNIQUES

Hooper, Emmet T. (U. Mich.) SELECTION OF FATS BY DERMESTID BEETLES, DERMESTIDAE. J. Mamm. 37(1): 125-126. Feb. 1956.

Dermestids can be induced to clean distasteful skeletal material if the material is soaked in water and then coated with codliver oil. Some other greasy substances also work, but not as well.

Mosby, Henry S., and Danny E. Cantner. (Va. Poly. Inst.) THE USE OF AVERTIN IN CAPTURING WILD TURKEYS AND AS AN ORAL-BASAL ANAESTHETIC FOR OTHER WILD ANIMALS. Southwestern Veterinarian 9(2). 5 unnumbered p. in reprint. Winter 1956.

Avertin was tested on several turkeys and on a few snakes, a turtle, and various birds and mammals. Effects are reported and precautions in use are discussed. "We conclude from these preliminary experiments that Avertin holds promise as an orally administered drug both for the capture of wild animals and for anaesthetising wild animals for close examination or treatment. For most small animals, the dosage appears to be in the vicinity of 0.075 to 0.09 grams of Avertin per pound of body weight. There is considerable variation in the susceptibility of different animals to this drug but no fatalities occurred when it was given at the rate of 0.09 grams or less per pound of body weight. Overdoses have resulted in fatalities but the fatal dosage level appears to be appreciably greater than the level at which satisfactory narcosis is obtained. In turkeys an irrigation technique appears to hold some promise for counteracting an overdose of Avertin."

Silen, Roy R. (Pac. NW. For. & Range Exp. Sta., Portland, Ore.) USE OF TEMPERATURE PELLETS IN REGENERATION RESEARCH. J. For. 54(5): 311-312, 1 fig. May 1956.

"Commercial temperature pellets are now available which in some ways are superior to more expensive instruments such as thermometers, thermographs, and thermocouples. They are cheap enough to permit extensive sampling, and they provide an accurate measure of the temperature in the hairline at the surface of the soil. They come in the form of 7/16-inch by 1/8-inch tablets which are inexpensive, accurate, insoluble, distinctively colored, generally waterproof for at least a year, easily fragmented to any desired size, and available in useful intervals of melting temperatures (113°F., 125°F., 138°F., 150°F., and 163°F., error ± 1 percent.) ...highly useful when there is a need for maximum temperature records at about 12° intervals."

Thompson, A. R. ROPE KNOTS AND CLIMBING. US Natl. Park Serv., Tree Pres. Bul. no. 7, rev. 20 p., illus. 1955. 15¢ from Supt. Documents. [From J. For. 54(3).]

WILDLIFE--MANAGEMENT & RESEARCH, GENERAL

Aldous, Shaler E., editor. SURVEY OF PITTMAN-ROBERTSON ACTIVITIES, 1955. US F&WS, Cir. 38. 1-164 p. Mar. 1956.

A useful reference that succeeds the P-R Quarterly. Every project of each state or territory is listed with statement of number, title, leader, and objectives. This occupies pages 3-107. The next section, Program Highlights, pages 108-123, summarizes the more interesting findings or results of many projects. New techniques and new ideas are emphasized in material selected for this section, but other material of wide interest is also included. Pages 124-160 list publications that appeared during the year and were based on P-R work. Addresses of state and territorial fish and game departments are listed on pages 161-162. A 2-page subject index completes the volume. This index covers both project listing and Highlights.

Clarke, C. H. D. (Dept. Lands & For., Toronto, Ont.) WILDLIFE RESEARCH IN THE NORTH AMERICAN ARCTIC. In Arctic Research / The current status of research and some immediate problems in the North American Arctic and Subarctic. Arctic 7(3/4): 255-265. 1954 (Dec. 1955).

Briefly reviews history of zoological work in Am. Arctic, points out areas from which collections are still needed, tells of the several laboratories now available in the region, and mentions various problems that merit investigation in the fields of life history, populations, parasites, diseases, and physiology. In closing, Clarke makes a point that has wide application: "Much of the recent research cannot be properly discussed because it remains unpublished. It may be expressed as a principle that for every grant of funds for research there should be a corresponding provision for publication." [Underlining ours.] A paper by M. J. Dunbar of McGill U. discusses problems of marine ecology and on p. 224-226 takes up the urgent need of conservation-oriented research on marine mammals. The other 26 papers of the volume discuss meteorology, geology, geography, glaciology, geophysics, oceanography, limnology, botany, soils, invertebrates, archaeology, human ecology, and cold acclimatization of the Eskimo.

Leopold, A. Starker. (MVZ, U. Calif., Berkeley.) THE CONSERVATION OF WILDLIFE. In A Century of Progress in the Natural Sciences 1853-1953. Calif. Acad. Sci. p. 795-807. 1955.

Good, brief review of history of wildlife trends in U. S. Shows how emphasis shifted from mere protection and predator control to artificial propagation and finally to habitat management and the policy of using heavy harvests to maintain high rate of productivity.

Lindemann, W. (Hannover Münden, Germany.) TRANSPLANTATION OF GAME IN EUROPE AND ASIA. J. Wildl. Mgt. 20(1): 68-70. Jan. 1956.

Several unfamiliar cases of attempted game transplantations in Europe are reviewed, and some problems created by such ill-advised efforts are pointed out. European literature references on transplantation are cited.--H. W. Levi.

WILDLIFE--HUNTING AREAS & PROBLEMS

Dickey, Charles H. SUCCESSFUL SHOOTING GROUNDS MANAGEMENT. COVER FOR SHOOTING GROUNDS. SHOOTING AREAS MUST PROVIDE DOGS. HOW TO STOP CANNIBALISM. PUBLIC RELATIONS FOR SHOOTING GROUNDS. Modern Game Breeding 26(2): 6-21, illus. Feb. 1956. [For availability, see end of review.]

This series of articles on practical management of commercial shooting grounds occupies nearly the whole issue of the journal. It is a well-rounded, authoritative account that covers more ins and outs of the subject than anything else the reviewer has seen. It is filled with a great amount of practical, down-to-earth advice to operators on handling birds, hunters, dogs, cover, and advertising. Sources of information on special topics are freely cited. The section on cover development is especially interesting in its emphasis on adaptations needed for the specialized requirements of commercial hunting. The discussion of cannibalism is surprisingly detailed. [Reprints are available from Sportsmen's Service Bureau, 250 E. 43d St., N. Y. 17, N. Y., as are 1-sheet leaflets listing commercial preserves in Conn., Md., N. J., N. Y., Ohio, and Pa.]

WILDLIFE--ECONOMIC & OTHER VALUES

Wallace, Robert F. (State Coll. Wash.) AN EVALUATION OF WILDLIFE RESOURCES IN THE STATE OF WASHINGTON. State Coll. Wash., Econ. & Bus. Studies, Bul. no. 28. vii + 63 p., 3 graphs. Feb. 1956. $1.00.

A good study of expenditures by sportsmen in 1954. It is based on questionnaires and follow-up interviews and statistical analysis of data. Results are presented simply and with exceptional clarity. Licensed sportsmen spent an average of $152 and a total of $68 million, plus $3 million for licenses. These are minimal figures. If the $71 million spent by sportsmen is combined with the $25 million paid to commercial fishermen, $96 million was spent for wildlife or its pursuit. This is more than was paid to farmers and ranchers for any crop except wheat. It is more than was spent in drug stores or on alcoholic drinks. Fishing was chief cause of expenditures, followed by big-game hunting, upland game hunting, and waterfowl hunting, in that order. Expenditures for various items are broken down by type of sport in which they were made. Transportation, boats and motors, and food and lodging were the most costly items. Relation of expenditures to fish and game conditions in Wash. is explained. Comparisons are presented with studies of wildlife economics made in other states.

WILDLIFE--FOOD HABITS & TECHNIQUES

Hanson, William R., and Franklin Graybill. (Ill. Nat. Hist. Surv., Urbana.) SAMPLE SIZE IN FOOD-HABITS ANALYSES. J. Wildl. Mgt. 20(1): 64-68. Jan. 1956.

Attention is called to a formula which permits one to determine the number of animals which, at various confidence levels, must be examined to estimate the proportion of a population that eats 1 major food. The major food that is eaten by the nearest to 50% of the population will require the largest sample. A sample large enough for it will be large enough for other major foods. Attention is called to another formula that permits one to determine the number of animals that must be examined, under different conditions, to estimate the mean vol. or wt. of 1 major food eaten by a population. To insure a normal distribution, the mean and the standard deviation of the 1 major food must be based only on those animals that ate some of the food. When the animals are being collected, their digestive organs may be opened in the field to see which contain this food. Collecting can stop when enough that contain the 1 food are found. The 1 major food that occurs in the digestive organs in the greatest range in vol. or wt. will generally require the largest sample. A sample large enough for it should be large enough for other major foods. A formula is derived for determining sample size needed to estimate mean vol. or wt. eaten of 1 food where it is required to know in advance of field work the total number of animals, both those eating and not eating a certain food, that must be collected.--W. R. Hanson.

WILDLIFE--PREDATION, CROP DAMAGE, CONTROL

Clay, William M. (U. Louisville.) SOME REMARKS ON THE ECOLOGY OF PREDATION. Ky. Warbler 31(4): 59-63. Nov. 1955.

Dr. Clay shows that prey populations have great reproductive ability and are seldom severely affected by predation. Many predators feed on a wide variety of animals, not just on desirable ones. Predation may be beneficial to prey populations and to man. Bird lovers need not worry about the blacksnake at the warbler's nest or about the legal hunter.

Durham, Leonard. EFFECTS OF PREDATION BY CORMORANTS AND GARS ON FISH POPULATIONS OF PONDS IN ILLINOIS. Ph. D. thesis, U. Ill. 117 p. 1955. [From abstract in Dissertation Abstracts 16(2).]

Effects of predation on condition and growth rate of various warm-water fishes in small ponds. "Food habits of cormorants were observed in the laboratory and in the field in order to determine roughly their food requirements. The stomachs of 62 double-crested cormorants contained fish ranging in total length from 3.5 to 12.2 inches. Five cormorants in the laboratory ate an average of 0.9 pounds of fish per bird per day for 71 days... On the basis of the above results, it appears that cormorants should be used as predators on fish populations on a short-term basis only. Shortnose gars appeared to be more practical for use in controlling fish populations than did cormorants."

Mossmann, Archie Stanton. EXPERIMENTAL STUDIES OF FITNESS AS MEASURED BY VULNERABILITY TO PREDATION. Ph. D. thesis, U. Wis. 134 p. 1955. [From Dissertation Abstracts 16(2).]

Important work on selection of handicapped prey by predators. Fish, birds, and mammals were tested. About half of the prey individuals were artificially handicapped in relatively minor ways, as by clipping fins or some wing feathers. Handicapped animals were more vulnerable to predation with few exceptions. It was concluded that efficient predators probably are much more important than inefficient ones in control of disease and in natural selection. Cover apparently reduced selectivity in 2 experiments. Evidence suggests that vulnerability increases with amount of disturbance. In corollary, predator pressure should rise faster than number of predators, especially where there is a variety of predators. Cover should be measured in relation to its ability to conceal stalking predators or to conceal prey. Motion was important for recognition of raptor by sparrows and as stimulus for attack on prey by predators that are visual feeders. Predation is discussed in relation to population fluctuations. "Using this information as a background it is hypothesized that cycles and eruptions should be least violent in complicated ecosystems and most violent in uncomplicated ecosystems (weather excepted). Field observations described in the literature seem to support this hypothesis."

Türcke, F. MITTEL GEGEN WILDSCHÄDEN UND IHRE ANWENDUNG. Verlag F. C. Mayer-Munchen-Solln. 122 p., 77 figs. 1953. [From review in Z. Jagdwissensch. 1(1).]

Book on recent German work on chemical means of preventing wildlife damage to plants. This book might prove of real value in repellent studies.

WILDLIFE--REPORTS OF ORGANIZATIONS & REPORTS OF HARVESTS

Bailey, Wayne. (W. Va. Cons. Comm.) UPS AND DOWNS OF OUR GREATEST GAME. W. Va. Cons. 20(2): 19-21, 3 figs. Apr. 1956.

Management and recent kills of bear and turkey in W. Va. Bear kill in 1955 was 83, down 10.7% from 1954. The decline is attributed to bears being scattered because of mast failure. The state could carry enough bears for annual kill of 200-400. Needed for this are: 1. Payment for bear damage, so enactment and enforcement of good bear laws would be possible. 2. Outlawing of hunting with dogs. Pa. makes out well with this restriction. 3. Change of public attitude toward bears. Turkey hunters made record kill of 1,590 in 1955, thanks largely to turkeys being concentrated in relatively few good food areas, and to better reporting system. "The kill in all open territory averaged .28 turkeys per square mile of forest. Despite this sharp upswing in 1955, the highest possible kill consistent with good management was not

achieved." Turkey kill in W. Va. may reach 2,000 when a year of mast abundance in both oak and high altitude areas is followed by an unusually warm May and normal or above normal, hunting pressure occurs the succeeding fall. Legal reported kill will also increase when poaching is reduced, more hunters report, and bag limit is increased. Wisdom of increasing bag limit on turkey is not yet known.

Branch of Federal Aid, Fish & Wildlife Service. FEDERAL AID IN FISH AND WILDLIFE RESTORATION / ANNUAL REPORTS OF THE DINGELL-JOHNSON AND PITTMAN-ROBERTSON PROGRAMS, 1955. Wildl. Mgt. Inst. (Wire Bldg.) and Sport Fishing Inst. (Bond Bldg.), Wash. 5, D. C. I-102 p., illus. Rec'd. Mar. 1956.
Reviews interesting accomplishments of many projects, lists and briefly describes all projects and their costs for each state, and presents financial statements.

Cottam, Clarence. (Welder Wildl. Found., Sinton, Texas.) THE WELDER WILDLIFE FOUNDATION. Atl. Nat. 11(4): 163-168, 4 figs. Mar.-Apr. 1956.
Origin, purpose, program, and organization of this new, private foundation for wildlife research and conservation. The 7,799-acre refuge is well preserved, well diversified, and extremely rich in wildlife.

Delaware. ANNUAL REPORT BOARD OF GAME AND FISH COMMISSIONERS...FOR THE FINANCIAL YEAR BEGINNING JULY 1, 1954 AND ENDING JUNE 30, 1955.
Intended chiefly for public; gives general picture of program.

Florida. BIENNIAL REPORT FLORIDA GAME AND FRESH WATER FISH COMMISSION FOR THE YEARS 1953-1954. 1-60 p., illus. 1955.
Intended more for public information than is the usual game department report, this one is written interestingly and published in magazine format. It does, of course, contain necessary financial statements and reports on work of all branches. The section on game management provides general information on research projects and their results. It includes tables showing acreage of management areas and kills made on these areas. Other tables show statewide game harvests, expenditures by hunters for various items, and numbers of hunters. These tables are broken down by region of state and by species or group of game where appropriate. Most data were derived from the post-season mail survey.

Massachusetts. DIVISION OF FISHERIES AND GAME ANNUAL REPORT 1955. 1-30 p. 1956?
Game sections of this report include data on: pheasants and quail propagated and released; snowshoe hares purchased and released; studies of stocking policy for pheasant, quail, and hare; wood duck boxes made, maintained, and used; plantings made and other management work done for farm game; management work and harvests on management areas; cottontails and beavers transplanted; deer kill, by counties; and fur harvest, by species.

National Wildlife Federation. 1955 YEARBOOK INCLUDING THE ANNUAL REPORT FOR 1954. Natl. Wildl. Fed. (Wash. 12, D. C.) 1-51 p. 1955.
Practically everyone in conservation work knows of the Natl. Wildl. Fed. but many do not know exactly what it is and what it does. This pamphlet gives much of the information one wants. It has a brief history of the group, short sections on functions and activities of the national organization, statement of income and expenditures, and reports, each approximately 1/2 page, from each of the state affiliates. These state reports list officers, tell size of membership, and concisely discuss programs and functions.

Nova Scotia. REPORT OF THE DEPARTMENT OF LANDS AND FORESTS / FISCAL YEAR ENDING MARCH 31, 1955. 1-56 p. + plates and folding tables. Rec'd. Mar. 1956.
The wildlife section discusses status and kills of various game species, presents table of beaver catch and table of furs (by species) exported during year. Moose were still increasing slowly. Deer kill was still rising except on Cape Breton Is. Probably the most valuable features of the report are table of deer kill 1916-54, table of moose kill 1908-37, and table of bears bountied 1942-54.

Pennsylvania. GAME COMMISSION MAKES FINAL REPORT ON PENNSYLVANIA'S 1955 HUNTING SEASON. Pa. Game News 27(4): 52-54, 1 fig. Apr. 1956.

Deer and bear are tabulated by county on basis of hunters' reports. Bear kill was 363 as opposed to 403 in 1954. Bears are said to have roved widely in recent years owing to mast failures. Kill of antlered deer was 45,044, antlerless 41,111, as opposed to total kill of 40,915 in 1954 when only antlered deer were legal. Statewide bags of small game are reported by species or group for 1954 and 1955 on basis of wardens' estimates. Apparently all small game was taken in larger numbers in 1955.

WETLANDS & WILDLIFE

Exernack, Francis J. (US Soil Cons. Serv., Lake Charles, La.) RANGE AND WILDLIFE IMPROVED. Soil Cons. 21(9): 204-207, 4 figs. Apr. 1956.

Coastal marshes along Gulf of Mexico have long been grazed by cattle. The cattle traveled along and worked out from old beach ridges. During high water, some areas were inaccessible and others were overused. Now walkways in the form of low dikes are being built across marsh. Borrow pits are staggered along both sides. Hence drainage channels are not created and cattle easily can get into marsh. Borrow pits almost always have water and constitute fur-animal habitat that is important in dry periods. They also benefit waterfowl. The more widespread grazing is said to improve this marsh for wildlife. Walkways cost about $1300 per mile, exclusive of culverts. Highways and oil-company access roads are also being built with staggered borrow pits.

Habekost, Robert C., Ian M. Frazer, and Bruce W. Halstead. (Coll. Med., Loma Linda, Calif.) OBSERVATIONS ON TOXIC MARINE ALGAE. J. Wash. Acad. Sci. 45(4): 101-103. Apr. 1955.

Lee, James A. (N. H. Game Dept.) WATERWAYS OF NEW HAMPSHIRE / THEIR TYPES AND DISTRIBUTION. N. H. Fish & Game Dept. About 250 unnumbered pages, 2 maps, proc. 1956.

This processed, spirally bound volume of 14 x 8.5 x 1.12 inches is the final report of a survey made by many men, 1945-48. Primary purpose of surveying all of the state's water areas was "to determine their status as waterfowl areas, and their potential for development." Presence of beaver and muskrat was noted and many data were taken on the waters and their surroundings. The report opens with brief accounts of the geology, topography, climate, major plant associations, and types of waterways of N. H. The rest of the volume consists of 2 sets of tables. The first set, "Acreage and Mileage of Waterways," provides a breakdown of waterway types by township, county and water area. The second set, "Physical and Biological Data for the Various Waterway Types in each County," gives data on color and fluctuation of water, nature of watershed, amount of marsh present, nature of bottom, altitude, pH of water, nature of shoreline, presence or absence of beaver and muskrat, quality of plant cover of water and shore, and waterfowl status. These data are not given for individual waters, but for all waters of a given type in a township.

McCabe, Robert A. (U. Wis.) WETLANDS AND WILDLIFE. Wis. Cons. Bul. 21(3): 24-28, 2 figs. Mar. 1956.

"It is illogical and unfair to berate the farmer for draining his wetlands. Some drainage is detrimental to the land and to wildlife, others could be prevented by some form of compensation to the land owner. In order to evaluate drainage adequately and to bring it into proper perspective, all operators of drainage equipment should be required by law to report annually their drainage operations. A game crop law should be worked out to help compensate the landowner for the use of his wetlands as wildlife habitat. A fair income from lands given to wildlife will prevent drastic changes in wildlife habitat. Once the future of wetlands is stabilized, there are numerous management practices which can be used to bring these lands into full fruition."

FARMLAND & WILDLIFE

Dale, Fred H. (Patuxent Refuge, Laurel, Md.) THE FARMER AND WILDLIFE MANAGEMENT. Soil Cons. 21(8): 186-189, 3 figs. Mar. 1956.

This is a preliminary, non-technical report of results of studies at the Patuxent Research Refuge to learn better ways to incorporate wildlife management into a modern farm program. The station's conservation farm has been demonstrated to be more productive of wildlife than the cover-deficient control, but it is not certain as yet which of several possible factors is responsible. The paper proposes that some farm practices that may be selected primarily for their agricultural value constitute good wildlife management and that the farmer need not sacrifice efficiency of his land in order to increase wildlife values.--F. H. Dale.

Hungerford, Kenneth E. (U. Idaho.) FOOD PATCHES FOR IDAHO FARMS. Idaho Wildl. Rev. 8(5): 10-11, 3 figs. Mar.-Apr. 1956.

The mixture developed for winter game-bird food consists of 5 parts safflower, 2 dwarf sunflower, 1 Idaho early amber sorgo, 1 squaw corn or flint corn, and 1 of field peas, barley, wheat, or millet. "Safflower is the backbone of the food patch and does a fine job of providing winter food as well as some cover." Patches should be placed near good cover and away from highways. Directions are given for planting.

Larsen, C. Syrach. PLANT FOR VILDTET (WILDLIFE PLANTINGS). J. H. Schultz A/S, University Press, Copenhagen. 1952. [From review by A. de Vos, J. Wildl. Mgt. 20(1).]

In Danish. Most big estates in Denmark are gone and hedges are going. Management for wildlife must be done by average landowners. Even small areas such as gravel pits should be planted. Shrubs are better than trees for the purpose. Larsen urges use of local, adapted species. "The following species are mentioned as most important: Prunus spinosa, Crataegus monogyna, Hippophaes rhamnoides, Lycium halimifolium, Rosa rugosa, Ulex europaeus, Sarothamnus scoparius. The planting of one or more species belonging to the following genera is also recommended: Rubus, Corylus, Sambucus, Prunus, Lonicera, Syringa, Ligustrum, Ribes, Pyrus, Sorbus, Rhamnus, Juniperus, Myrica, Salix, Fagus, Betula, Alnus, Pinus and Picea. It is interesting that the Danes capitalize mainly in indigenous species, an approach which may be looked into somewhat further on the North American continent."

Various authors. A HANDBOOK OF FARM GAME MANAGEMENT IN NORTH CAROLINA. N. C. Wildl. Resources Comm., Proj. W-25-D. v + 48 p., illus., proc. Nov. 1955.

A detailed, practical guide for men who work with farmers to get wildlife habitat improvement on the land. It takes up selection of species and varieties of plants; location, establishment, and maintenance of each type of planting; and various other practices of importance. Major sections are devoted to shrub lespedezas, multiflora rose, sericea, annual plantings for quail, pasture plantings for rabbits, special combination plantings for livestock farms, management of drainage ditches for game, right-of-way management, squirrel management, principles of farm-game harvest. Present version of this handbook is preliminary, according to Robert B. Hazel; a revised, printed edition is planned.

RANGELAND & WILDLIFE

Clark, Edwin C. (U. Calif., Albany.) THE GREAT BASIN TENT CATERPILLAR IN RELATION TO BITTERBRUSH IN CALIFORNIA. Calif. Fish & Game 42(2): 131-142, 4 figs. Apr. 1956.

Good study of a pest that can contribute to decline of Purshia tridentata ranges, which are important to deer and livestock.

Cornelius, D. R., and M. W. Talbot. RANGELAND IMPROVEMENT THROUGH SEEDING AND WEED CONTROL ON EAST SLOPE SIERRA NEVADA AND ON SOUTHERN CASCADE MOUNTAINS. US Dept. Agr. Handbook no. 88. iii + 51 p., illus. 1955.

Dix, Ralph Leo. PHYTOSOCIOLOGICAL CHANGES ON THE THIN-SOIL PRAIRIES OF WISCONSIN UNDER THE INFLUENCE OF GRAZING. Ph. D. thesis, U. Wis. 162 p. 1955. [From long abstract in Dissertation Abstracts 15(12).]

Riordan, Laurence E., and Ross L. Campbell. (Colo. Dept. Game.) HARMONY ON THE RANGE. Colo. Outdoors 5(2): 1-6, 6 figs. Mar.-Apr. 1956.
Brief but significant report of experimental studies of range use by mule deer, cattle, and sheep on pinon-juniper-mountain brush-grass range in w. Colo. Work was done in 9 pastures at Little Hills Exp. Sta. in White River region. Data for nearly 10 years are available. Three pastures were stocked with cattle, 3 with sheep, for 6-8 weeks each spring and fall. Three were stocked with deer from fall into April. Food preferences and utilization were determined by stem measurements and other means. Preferred foods of the 3 animal species are listed. Only mountain mahogany was high on list for all 3 animals. It was found that proper stocking was 20 acres per month per cow, 3 per sheep, 2 per deer. This is 100% less stocking than recommended by Bureau of Land Mgt. for cattle, 50% less for sheep--and the BLM has been attacked as too conservative in stocking. With overstocking, some food species nearly disappeared and erosion set in. This was especially true in sheep and cattle pastures. With overstocking of deer, grasses and forbs increased, improving land for watershed and livestock. Choice deer browse species were severely browsed, of course. Conclusions: There is little likelihood of serious competition between the 3 kinds of animals where flora is varied and stocking is not excessive. For sustained use, numbers of each kind of animal must be so regulated that its preferred foods will not be damaged even in unfavorable years. This means that non-preferred foods will be little used, giving appearance of wasted forage. Few graziers or administrators now operate in this fashion, but they would profit from so doing. Highest production of meat and hides almost always can be obtained from conservative, balanced stocking of both deer and cattle or deer, cattle, and sheep.

FORESTLAND--FORESTRY & ECOLOGY

Bray, John Roger. THE SAVANNA VEGETATION OF WISCONSIN AND AN APPLICATION OF THE CONCEPTS ORDER AND COMPLEXITY TO THE FIELD OF ECOLOGY. Ph. D. thesis, U. Wis. 291 p. 1955. [From long abstract in Dissertation Abstracts 16(2).]
Technical study of forest-grassland areas, with emphasis on factors (such as fire, light, moisture and soil chemistry) that are correlated with occurrence of given types of stands. Various theoretical considerations of advanced ecology are also discussed.

Jones, Jewell Johanna. CONIFER SWAMPS OF WISCONSIN. Ph. D. thesis, U. Wis. 96 p. 1955. [From long abstract in Dissertation Abstracts 15(12).]
Ecological analysis of 79 stands representing various types of conifer swamps. Discusses correlation of the existing vegetation with environment.

Ware, George Henry. A PHYTOSOCIOLOGICAL STUDY OF LOWLAND HARDWOOD FORESTS IN SOUTHERN WISCONSIN. Ph. D. thesis, U. Wis. 280 p. 1955. [From long abstract in Dissertation Abstracts 16(2).]
"The composition, range of variation, and ecological relationships of the [swamp and floodplain] hardwood forests of southern Wisconsin were studied by means of quantitative information obtained by the sampling of 114 stands widely distributed over the southern half of the state. The study was restricted to forests of natural origin which displayed no indications of past disturbances such as fire, cutting, and grazing." Special attention is applied to degree of importance and adaptation of tree species, and to ecology of swamps.

FORESTLAND--MANAGEMENT FOR & DAMAGE BY WILDLIFE

Skude, M. EXPERIMENTS IN PROTECTING FOREST PLANTS AGAINST DAMAGE BY WILDLIFE WITHOUT USE OF FENCES. Dansk Skovforenings Tidsskrift. 2. Heft 1954. (Pages not stated.) [From abstract in Z. Jagdwissensch. 1(1).]
In Danish.

Stoeckeler, J. H., and H. F. Scholz. (Lake States For. Exp. Sta., St. Paul 1, Minn.) A CYLINDRICAL SCREEN FOR PROTECTING DIRECT SEEDINGS OF FOREST TREE SPECIES. J. For. 54(3): 183-184, 3 figs. Mar. 1956.

Tevis, Lloyd, Jr. (U. Calif., Davis.) SEED SPOT METHOD OF CENSUSING FOREST-RODENTS. J. For. 54(3): 180-182. Mar. 1956.

The method was found practical for judging presence or absence of small mammals that could interfere with forest seeding operations. It did not provide exact figures on population density. In using the method, a few coniferous seeds were buried 1/2 inch deep in each of 100 spots which were distributed along a line in groups of 5. Distance between spots in a group was 6 feet. Distance between groups was 30 feet. Number of spots robbed was considered the rate of seed-spot robbery for the time involved and was expressed in percentage. The method is easier than trapping and its results are more significant for reseeding operations. Factors affecting behavior of mice in relation to seed spots are discussed. Ways of recognizing disturbance by mice, shrews, and chipmunks are described.

STRIPPED LAND & MISCELLANEOUS HABITATS

Einspahr, Dean William. COAL SPOIL-BANK MATERIALS AS A MEDIUM FOR PLANT GROWTH. Doctoral thesis, Iowa State Coll. 1955. [From long abstract in Iowa State Coll. J. Sci. 30(3).]

Spoil-bank material from Iowa localities was studied by chemistry, by laboratory plantings, and by field plantings. Limiting factors were worked out and requirements for lime and fertilizer were determined. Recommendations are made for species of trees, legumes, and grasses that did well on spoil that was not too acid. Planting methods for grasses and legumes are discussed. Some spoils were so acid that their lime requirements were both prohibitive and continuing. Improvement of acidity by weathering and leaching was not rapid. Phosphorus was the plant nutrient that first limited plant growth on certain spoils. "An investigation into methods of improving the physical and chemical properties of spoil-bank materials indicated modification of strip-mining methods was the most feasible way of spoil-bank improvement. The modifications would involve identification of potentially troublesome overburden and taking special precautions to see that this material was covered by one of the better types of spoil materials. Wider use of strip-mining techniques similar to the presently used 'bench method' would greatly improve the chemical and physical properties of the surface materials."

Latham, Roger M. (Pa. Game Comm.) RIGHTS-OF-WAY FOR WILDLIFE. Pa. Game News 27(4): 19-23, 3 figs. Apr. 1956.

Latham demonstrates the wildlife values of rights-of-way, especially those with grassy middle strip and increasingly tall brush toward sides. Native plants sometimes serve very well in these areas. But inferior species may dominate a site, and extensive, uniform coverage (even by a useful species) is not desirable. Pa. has 88 species under test for planting on rights-of-way. One of them, rose clover (Trifolium hirtum), seems especially promising because of its wide range of tolerance, durability, and forage value. Tests of herbicides have revealed no ill effects to wildlife when directions are followed. Selective spraying of young trees is considered a satisfactory and economical means of maintenance on rights-of-way.

Schomaker, Charles E. LOBOLLY PINE SUCCEEDS ON SPOIL BANKS. US For. Serv., S. For. Exp. Sta. (New Orleans, La.), S. For. Notes no. 102: 2-3. Mar. 1956.

"Loblolly, shortleaf, and longleaf pine, and white ash, were planted in March 1946 on one-year-old spoil banks [from coal mining] near Jasper, Alabama. Sycamore, tupelo gum, and white ash were planted along the margin of a permanently wet depression created by the mining." Loblollies av. 19 ft. tall and have survival of 77%. Shortleaf pine did nearly as well. Sycamore was the only hardwood that did well, with av. height of 17 ft. and good survival. "The slow progress in natural restocking of the mined area indicated that spoil banks should be planted, preferably with loblolly pine."

STRIPPED LAND & MISCELLANEOUS HABITATS--Continued

Wilson, H. A., and Gwendolyn Stewart. AMMONIFICATION AND NITRIFICATION IN A STRIP MINE SPOIL. W. Va. U. Agr. Exp. Sta. (Morgantown), Bul. 379T. 1-16 p., 3 figs. June 1955.

Of value in revegetating mine spoil. "A laboratory study of the ammonifying and nitrifying powers of nonvegetated and vegetated spoil samples from one coal strip-mined area were compared with those of samples taken of a near-by soil."

CONTROL OF UPLAND VEGETATION WITH HERBICIDES ETC.

Ruth, Robert H., and Carl M. Berntsen. CHEMICAL BASAL TREATMENT TO CONTROL RED ALDER. US For. Serv., Pac. NW. For. & Range Exp. Sta. (Portland, Ore.), Res. Note no. 128. 1-6 p., illus. Mar. 1956.

Alder was readily killed by basal sprays of 2,4,5-T or foliage sprays of 2,4-D. Data are given. Of wide potential usefulness is the horseshoe-shaped spray nozzle illustrated. It should make spraying the entire circumference of a stem quicker, simpler, and cheaper.

MAMMALS--GENERAL

Findley, James S., and Sydney Anderson. (U. of N. M.) ZOOGEOGRAPHY OF THE MONTANE MAMMALS OF COLORADO. J. Mamm. 37(1): 80-82, 1 map. Feb. 1956.

Hart, J. S., and O. Heroux. EXERCISE AND TEMPERATURE REGULATION IN LEMMINGS AND RABBITS. Can. J. Biochem. & Physiol. 33(3): 425-428. May 1955. [From J. Mamm. 37(1).]

Hart, J. S. (Natl. Res. Labs., Ottawa, Ont.) SEASONAL CHANGES IN INSULATION OF THE FUR. Can. J. Zool. 34(1): 53-57, 2 figs. Feb. 1956.

Abstract: "Seasonal changes in insulation of the fur have been compared in nine species of arctic and North temperate zone mammals. Relative seasonal changes ranged from 12 to 52% of the winter value. Absolute changes were greatest in the larger mammals with the thickest fur. The limited seasonal insulative change in small mammals suggests that changes in heat production may be important in seasonal acclimatization." Species studied were Peromyscus maniculatus, Dicrostonyx groenlandicus, Tamiasciurus hudsonicus, Ondatra zibethicus, Lepus americanus, Vulpes fulva, Gulo luscus, Canis lupus, Euarctos americanus, and Thalarctos maritimus.

Linder, Raymond L., and George O. Hendrickson. (Iowa State Coll.) A DOOR CATCH FOR THE WOODEN BOX TRAP. J. Wildl. Mgt. 20(1): 96. Jan. 1956.

Describes a strap-metal catch to hold door closed on release and to guard the trapped animal from predators.--G. O. Hendrickson.

Lyman, C. P., and P. O. Chatfield. PHYSIOLOGY OF HIBERNATION IN MAMMALS. Physiol. Reviews 35(2): 403-425. April 1955. [From J. Mamm. 37(1).]

Mosby, H. S. (Va. Poly. Inst.) LIVE TRAPPING OBJECTIONABLE ANIMALS. Va. Poly. Inst., Agr. Ext. Serv., Cir. 667. 4 p., 3 figs. Sept. 1955.

Photos, diagrams, bill of materials, instructions for construction and use of wooden live trap suitable for capture of animals ranging in size from chipmunk to woodchuck. Cost of materials should not exceed $1.50. Time required for construction is about 1.5-2 hours. The trap has no protruding parts and is quite different in construction from the familiar traps based on the old Biological Survey cat trap. It has been used satisfactorily at V. P. I. for a number of years.

Nice, Margaret M., Constance Nice, and Dorothea Ewers. (5725 Harper Ave., Chicago 37, Ill.) COMPARISON OF BEHAVIOR DEVELOPMENT IN SNOWSHOE HARES AND RED SQUIRRELS. J. Mamm. 37(1): 64-74. Feb. 1956.

From summary: "The development of motor coordinations during the first week of two snowshoe hares is described, as well as that of several red squirrels from about 12 to 48 days. Comparisons are made with other studies on hares and squirrels and also on the European hamster. The sequence of appearance of

behavior patterns proved to be much the same in the precocial lagomorph and the altricial rodents... Factors influencing incubation [of birds] are briefly compared with those affecting gestation; the problems met by mammals are concluded to be more complex than those met by birds. Both classes show markedly different rates of development that have evolved in different orders and families and in response to different external conditions."

Various authors. TRAITÉ DE ZOOLOGIE. ANATOMIE, SYSTEMATIQUE, BIOLOGIE. Vol. XVII. MAMMIFÈRES. LES ORDRES: ANATOMIE, ÉTHOLOGIE, SYSTÉMATIQUE. Parts 1 & 2. Masson, Paris. 2300 p., illus. 1955. Paper, F.22,000; cloth, F.23,600. [From long review by D. H. Johnson, Science, Apr. 27, 1956.]

"...a systematic account of the living and extinct orders of mammals... Some idea of its magnitude may be gained from the fact that the two bulky fascicles include a total of 2300 pages and are illustrated with 2106 text figures and four colored plates. ...the forthcoming sixteenth volume...is to be devoted to anatomy and reproduction... The thirteen authors who have collaborated to produce it are leaders among modern French zoologists and paleontologists. The orders of mammals are treated in sequence and in remarkable detail, which extends in some instances down to the generic and even the specific level... The system of classification adopted here represents an adroit blending of old concepts of classical zoology and the revolutionary modern ideas of paleontology... Anatomy and reproduction, although primarily reserved for another volume in the series, are treated at some length and in a highly competent manner in each account of a recent order. Habits, habitats, and geographic distribution, which can be most satisfactorily dealt with at the specific level, receive rather cursory treatment. There is no general coverage of subjects such as zoogeography and population dynamics... The bibliographies are extensive and well chosen; they include some surprisingly recent titles. Teachers, advanced students, and systematic mammalogists will find this treatise to be an indispensable reference and source book..."

MAMMALS--FAUNAS AND MANUALS

Alvarez del Toro, Miguel. ANIMALES SILVESTRES DE CHIAPAS. Ediciones del Gobierno del Estado, Tuxtla Gutierrez, Chiapas. 247 p., illus. 1952. [From J. Mamm. 37(1).]

Bee, James W., and E. Raymond Hall. MAMMALS OF NORTHERN ALASKA / ON THE ARCTIC SLOPE. U. Kans. Mus. Nat. Hist., Misc. Publ. no. 8. 1-309 p., 127 figs., 4 plates, 1 col. plate. Mar. 1956. $1.00, paper; $4.00, cloth.

Important research report with much information on ecology and natural history. It includes data from field work by authors and others in 1951 and 1952, data from museum collections, and data contributed by cooperators. Each species account includes Eskimo name, synonymy, description, spot map, records of occurrence, and drawing of skull. Most species accounts, especially those for small mammals, carnivores, and artiodactyls, report extensive observations on life history, population changes, ecology, and seasonal variation. The material on seasonal changes in skulls would constitute a significant paper by itself and so would the material on microtine biology and cycles. The considerable amounts of information given on wolf, grizzly, and caribou should also be mentioned. Geographic variation and taxonomy are discussed for some forms. In general the taxonomy is conservative; Eurasian specific names are used only where the authors believe the need has been established. Marine mammals are included, but little information on them is given except for description and occurrence. The key is exceptionally thorough and detailed. Some factors that may influence cycles are discussed in the book's introduction. An 18-page section describes the area and its biotic communities. The bibliography occupies 12 pages.

MAMMALS--PARASITES AND DISEASES

Calhoun, E. L., C. O. Mohr, and H. I. Alford, Jr. DOGS AND OTHER MAMMALS AS HOSTS OF TULAREMIA AND OF VECTOR TICKS IN ARKANSAS. Am. J. Hygiene 63(3): 127-135. Mar. 1956.

Study included various species of wild mammals.

Link, Vernon B. A HISTORY OF PLAGUE IN THE UNITED STATES. US Pub. Health Serv., Pub. Health Monog. no. 26. 1-120 p., illus. 1955. 60¢ from Supt. Documents.

Chapter 12, Modern plague control methods, emphasizes rodent flea control by 10% DDT dusting followed by the newer rodenticides. Chapter 5, Plague in wild animals, gives a detailed history of sylvatic plague in this country.

Linsdale, Jean M., and Betty S. Davis. (Jamesburg Route, Carmel Valley, Calif.) TAXONOMIC APPRAISAL AND OCCURRENCE OF FLEAS AT THE HASTINGS RESERVATION IN CENTRAL CALIFORNIA. U. Calif. Publ. Zool. 54(5): 293-370, 27 figs., plates 11-22. Mar. 1956. $1.50 from U. Calif. Press.

The summary gives an excellent description of this important study of fleas of mammals on the central coastal region of Calif.: "A study of animals on 1,600 acres of protected land during the period from 1937 to 1954 has resulted in the collection of 24,759 fleas from 2,459 mammals. The 27 species of fleas taken from 34 species of mammals provided material for analysis of variability and for taxonomic reappraisal of certain forms. Comments on morphology and illustrations of diagnostic structures have also been included. The variety of host relationships has been presented in figures tabulating the seasonal occurrence of fleas on each mammal host and in discussions relating to these figures. The occurrence of each species of flea on its various hosts has been outlined. A discussion of various ecological factors relating to the occurrence of fleas here has been presented, and the flea-host relationships have been discussed."

Zimmermann, W. J., L. H. Schwarte, and H. E. Biester. (Iowa State Coll.) INCIDENCE OF TRICHINIASIS IN SWINE, PORK PRODUCTS, AND WILDLIFE IN IOWA. Am. J. Pub. Health 46(3): 313-319. Mar. 1956.

Frequency of trichiniasis in swine and pork products has diminished greatly where garbage is cooked before it is fed to hogs. But some trichiniasis persists. Is the reservoir in wildlife? The authors found trichinae in several kinds of wild mammals and concluded that rats, foxes, and minks might be important sources. Coyotes, raccoons, and opossums were considered less important, coyotes because rare in Iowa, raccoons and opossums because of low incidence of infections. Transmission by eating infected carcasses was verified, but transmission by eating feces was not verified in 9 trials, although it had been demonstrated by other workers.

SHREWS, MOLES, BATS

Beer, James R., and A. Glenn Richards. (U. Minn.) HIBERNATION OF THE BIG BROWN BAT. J. Mamm. 37(1): 31-41, 3 figs. Feb. 1956.

Environmental conditions in artificial sandstone caves at St. Paul, Minn.; seasonal weight changes of thousands of bats; changes in fat and water content of bodies; characteristics of fats; effects of humidity. Fat reserves were nearly used up during winter and declined past danger point in some individuals. Probably Eptesicus could not overwinter much further north.

Christian, John J. (Nav. Med. Res. Inst., Bethesda, Md.) THE NATURAL HISTORY OF A SUMMER AGGREGATION OF THE BIG BROWN BAT, EPTESICUS FUSCUS FUSCUS. Am. Midl. Nat. 55(1): 66-95, 7 figs., 6 pls. Jan. 1956.

"Important, technical, quantitative study of reproductive cycle, and of exact age determination by use of canine wear and annular rings of dentin. Number of young is discussed critically. Data are given on adrenal gland changes, growth of young, and juvenile mortality." From WR 75: 28.

Cockrum, E. Lendell. (U. Ariz.) HOMING, MOVEMENTS, AND LONGEVITY OF BATS. J. Mamm. 37(1): 48-57. Feb. 1956.

"This paper summarizes the results of three aspects of banding studies (homing experiments, movements, and longevity) as reported by others in the literature, and records some of the results of banding studies made by the author." Some species definitely have homing ability. Diurnal movements and local migrations have been studied relatively little. Seasonal migrations have been demonstrated by various workers. Evidence that tree bats migrate is still of indirect nature. Longevity is reviewed on the basis of records of captives, life expectancy tables, and recoveries of banded individuals. Ages of 10 years are not uncommon and ages of at least 14 years are possible.

Cunningham, John D. (U. Calif., L. A.) ECOLOGY AND OCCURRENCE OF NOTIOSOREX IN SOUTHERN CALIFORNIA. J. Mamm. 37(1): 108-110. Feb. 1956.

Griffin, Donald R., and Alvin Novick. (Harvard U.) ACOUSTIC ORIENTATION OF NEOTROPICAL BATS. J. Exp. Zool. 130(2): 251-299, 11 figs. Nov. 1955.
Long detailed paper. Sounds made by 16 species of 4 families were analyzed and correlated with relationships, habits, and ability to avoid obstacles. "There seems to be a clear correlation between high sound intensity and habits that require the capture of flying insects in the open. On the other hand the bats that are known to feed on fruit, together with the vampire bat...emit pulses having only about 1/1000 of the sound energy that characterizes bats which feed on insects or fish."

Herland, Marc. ETUDE COMPARATIVE SUR L'ACTIVITE GENITALE DES CHEIROPTERES. Ann. Soc. Roy. Zool. Belgique 85(1): 87-116. 1953. [From J. Mamm. 37(1).]

Rudd, Robert L. (U. Calif., Davis.) POPULATION VARIATION AND HYBRIDIZATION IN SOME CALIFORNIAN SHREWS. Syst. Zool. 4(1): 21-34, 7 figs. Mar. 1955.
Analysis of populations of Sorex sinuosus and certain populations of S. ornatus. Pertains chiefly to San Francisco Bay region.

Serafínski, Wlodzimierz. MORPHOLOGICAL AND ECOLOGICAL INVESTIGATIONS ON POLISH SPECIES OF THE GENUS SOREX L. (INSECTIVORA, SORICIDAE). Acta Theriologica, Inst. Zool. Polska Akad. Nauk (Warsaw) 1(3): 27-86. Mar. 1955. [From J. Mamm. 37(1).]
In Polish with English and Russian summaries.

Stegeman, LeRoy C. (State U. of N. Y., Coll. For., Syracuse 10.) TOOTH DEVELOPMENT AND WEAR IN MYOTIS. J. Mamm. 37(1): 58-63, 2 figs. Feb. 1956.
Based on 585 skulls collected at one time and place. Skulls of young were too delicate for cleaning by cooking or dermestids but were cleaned adequately by larvae of clothes moths. Characteristics of teeth of first 4 year groups are described and figured. Older groups were not represented in sample. Numbers in each age group are reported, so age composition of sample is clear.

Troyer, John Robert. HISTOCHEMICAL AND BIOCHEMICAL STUDIES OF LIVER GLYCOGEN IN THE VESPERTILIONID BAT, MYOTIS LUCIFUGUS LUCIFUGUS. Ph. D. thesis, Cornell U. 114 p. 1955.
"In conclusion, liver glycogen content is highest in the first month of hibernation, but declines, through utilization, during the dormant period... The lower levels of glycogen in active bats undoubtedly are associated with a greater activity, and correspondingly greater expenditure of energy, than that found in hibernating animals. It is postulated that increased temperatures indirectly induce an increased carbohydrate metabolism which results in a decrease in liver glycogen in the bat. Glyconeogenesis is suggested by the partial restoration of liver glycogen levels in bats which were returned to the cold-room. The adrenal glands are necessary for maintaining the liver glycogen and blood sugar levels of hibernating animals." Administration of alloxan had no consistent effect on glycogen distribution in hibernating bats.

Twente, John W., Jr. (U. Fla.) ECOLOGICAL OBSERVATIONS ON A COLONY OF TADARIDA MEXICANA. J. Mamm. 37(1): 42-47. Feb. 1956.
Bats studied used a gypsum cavern in Woods Co., Okla. during warm season. Paper reports numbers, migration, weight changes, habitat selection, body temperatures, losses to predation, sex ratios, age groups, behavior.

RABBITS AND PIKAS

Adams, Lowell, S. B. Salvin, and W. J. Hadlow. (Missoula [Mont.] For. Res. Center.) RINGWORM IN A POPULATION OF SNOWSHOE HARES. J. Mamm. 37(1): 94-99, 5 photos. Feb. 1956.
From summary: "An isolated population...on an island in Flathead Lake, Montana, was found to be infected with the well-known ringworm fungus, Trichophyton mentagrophytes." Symptoms, pathology, and the fungus are described. "The incidence of infection was about 35 per cent of the population. The

incidence appeared to vary slightly with the season of the year and the age of the hare, but not with the animals' sex. Mortality may have been greater in the diseased hares... The low incidence of infection and non-debilitating nature of the disease indicates its possible enzootic character. Because of the hares' mild reaction to the disease, they may serve as a reservoir for infection of other wild animals, domestic animals, or humans."

Armour, C. J., and Harry V. Thompson. (Min. Agr., Tolworth, Surrey, Eng.) SPREAD OF MYXOMATOSIS IN THE FIRST OUTBREAK IN GREAT BRITAIN. Ann. Applied Biol. 43(3): 511-518, map. Sept. 1955.

Rate of spread where not aided by man, means of transmission (probably fleas in this outbreak), mortality and immunity of rabbits, effects of outbreak. Rabbits were almost eliminated. Foxes seemed to be turning to other prey. Crops improved: "West Kent farmers in an area covering 1840 acres estimated that they had obtained increases of 18-30% in the yields of cereals, after myxomatosis had swept their land..."

Bowers, Glenn L. (Pa. Game Comm.) RECIPE FOR RABBITS. Pa. Game News 27(4): 24-30, 35, 4 figs. Apr. 1956.

A specialist gives detailed, specific instructions for improving cottontail habitat. Suitable proximity of habitat elements is emphasized. Bowers tells how to establish and maintain food plots; how to provide cover by planting, border cutting, half-cutting, and herbicides. At the end of his paper he presents, in outline form, directions for selection and preparation of site, liming, fertilizing, seed mixtures and seeding rates, nurse crops, and maintenance.

Chapman, Floyd B. (Ohio Div. Wildl.) WOODCHUCKS AND COTTONTAILS. Ohio Cons. Bul. 20(5): 20, illus. May 1955.

Cottontails were stocked and allowed to breed in 5-acre pens. Some of the pens also contained woodchucks and their burrows. "Each spring five pairs of rabbits were placed in each pen with the woodchucks, and each fall all the rabbits were counted. As many as 90 rabbits were taken from one 5-acre pen. The pen tops were not covered and hawks and owls carried out many rabbits. Did the pens with 'chuck dens save more rabbits? No. The pens without woodchuck dens often produced more rabbits than those with them during the four year study." The author believes that woodchuck dens in the wild tend to give cottontails so much protection that adequate hunter harvest cannot be obtained.

Herman, Carlton M., Lawrence Kilham, and Oscar Warbach. (Patuxent Refuge, Laurel, Md.) INCIDENCE OF SHOPE'S RABBIT FIBROMA IN COTTONTAILS AT THE PATUXENT RESEARCH REFUGE. J. Wildl. Mgt. 20(1): 85-89. Jan. 1956.

223 cottontails examined intermittently from Mar. 1947 to Dec. 1950 were free of observable fibromas until Dec. 1950 when 3 of 16 animals presented tumors. In 1951, 12 of 70 rabbits had grossly evident tumors and sera from 16 of 36 had demonstrable neutralizing antibodies when tested against Shope (OA) fibroma virus. No evidence of fibroma could be demonstrated in 37 rabbits examined in 1952, 29 examined in 1953, or in controls from two other areas (Md. and Kans.) examined during the period of fibroma presence in cottontails at the Patuxent Res. Refuge.--C. M. Herman.

Mills, I. H. THE PRENATAL SEX RATIOS IN WILD RABBITS. J. Endocrinol. (Cambridge, Eng.) 12(3): ix-xi (proceedings). May 1955. [From J. Mamm. 37(1).]

Sheffer, Dale E. (Md. Game Comm.) 1955 COTTONTAIL RABBIT PROPAGATION STUDY AT GWYNNBROOK FARM SMALL PEN ENCLOSURES. Md. Cons. 33(2): 6-9, 7 figs. Mar. 1956.

Four pens, 50 x 50 feet, were supplied with food and cover. One ♂ and 1, 2, or 3 ♀♀ were placed in each pen. The 7 ♀♀ produced 167 young, an av. of nearly 24 per ♀. Of these young, 36 died from various causes, chiefly weather. Cost was $2.74 per rabbit removed for restocking.

Tyndale-Biscoe, C. H. (D.S.I.R., Wellington, N. Z.) EFFECTS OF SUB-LETHAL PHOSPHORUS POISONING ON BONE GROWTH IN WILD RABBITS. New Zealand J. Sci. & Tech., Sec. B, 37(3): 407-415, 4 figs. Nov. 1955.

Summary: "Abnormal bone growth in ten wild rabbits [Oryctolagus] is described. These rabbits were part of a larger sample, collected from an area where phosphorized pollard had been used three months before, and it is concluded that the bone abnormalities were due to the ingestion of sub-lethal doses of phosphorus at that time. The implications of this to the use of phosphorus as a rabbit poison are discussed and it is suggested that the particle size of the phosphorus may have been an important factor in the rabbits' recovery."

RODENTS--MISCELLANEOUS

Clarke, John R. (Oxford U., Eng.) THE AGGRESSIVE BEHAVIOR OF THE VOLE. Behavior 9(1): 1-23, 13 figs. 1956.

Interesting, illustrated account of many behavior patterns associated with threatening, fighting, and other dominance-subordinance relationships in Microtus agrestis. Factors affecting dominance in this vole are discussed briefly.

Cramblet, Howard M., and Richard L. Ridenhour. (Humboldt State Coll.) PARTURITION IN APLODONTIA. J. Mamm. 37(1): 87-90, 2 figs. Feb. 1956.

Includes description and early growth of young.

Eskridge, Paul S. RELATIONSHIPS BETWEEN ENVIRONMENTAL STRESS AS REPRESENTED BY FREEZING TEMPERATURES AND LACK OF NESTING MATERIAL AND REPRODUCTIVE ACTIVITY AND VIABILITY IN PEROMYSCUS MANICULATUS. Ph. D. thesis, U. Pittsburgh. 41 p. 1955. [From long abstract in Dissertation Abstracts 16(1).]

Increase of size of testis under increasing lengths of light was significantly greater in mice that could huddle together and build nests. Exposed individuals not only had smaller testes but ate more than twice as much and still lost weight. A fat-rich diet was necessary for survival of single mice without nesting material under prolonged exposure to freezing temperatures.

Frank, Fritz. THE ORIGIN OF NEW FIELDMOUSE PLAGUE AREAS THROUGH IMPROVEMENT AND CULTIVATION OF MOORS. Wasser und Boden 5(11): 1-4. 1953.

In German. Recent drainage of 3 moors in nw. Germany, followed by cultivation, has resulted in an overabundance of field mice (Microtus arvalis), which have caused severe crop damage.—V. F. Flyger.

French, Robert L. (U. of S. Calif., L. A.) EATING, DRINKING, AND ACTIVITY PATTERNS IN PEROMYSCUS MANICULATUS SONORIENSIS. J. Mamm. 37(1): 74-79. Feb. 1956.

Use and needs of water by captive desert mice. Results of water shortage on weight, behavior, and food consumption.

Gunther, W. C. (Valparaiso U., Ind.) STUDIES ON THE MALE REPRODUCTIVE SYSTEM OF THE CALIFORNIA POCKET GOPHER (THOMOMYS BOTTAE NAVUS MERRIAM). Am. Midl. Nat. 55(1): 1-40, 17 figs. Jan. 1956.

Describes studies based on monthly autopsies of animals from field and laboratory populations. "Two structures, a coagulating gland and a dorsal prostate, hitherto unreported, have been proposed as constant elements of the... system. Homologies of these and other portions of the reproductive system have been discussed. A type of cyclical reproductive activity has been suggested..., neither seasonal nor continuous, but intermediate in scope, during which individual animals undergo alternating periods of sexual activity and partial testicular regressions without regard to season or age once maturity has been attained. Spermatogenesis and other testicular functions have been discussed. The histology of the accessory sexual organs in the normal animal has been described..." Effects of castration and endocrine dosage are discussed.

Harrington, Edward James. A STUDY OF POSTNATAL SKELETAL DEVELOPMENT AND AGE DETERMINATION IN THE MEADOW MOUSE, MICROTUS PENNSYLVANICUS (ORD). Ph. D. thesis, Cornell U. 72 p. 1955. [From abstract in Dissertation Abstracts 15(12).]

"By listing the time and order of appearance of the various ossification centers and the time of fusion of certain epiphyses a scale was derived by which one may estimate the age of field mice for the first four months of life. This is reasonably accurate to the day for the first two weeks, to the week for the first two months and to the month for the following two months. External linear measurements, weight, the linear measurements of the bones themselves, the development of the crests and processes on the skull, and the weight of the bones are of little aid in establishing definite age groups. All of these criteria applied to known age material provided groups with large overlaps. The clearing and staining technique would seem to be the best method for aging mice below four months of age or in establishing groups which would lie above and below this age."

Hoffmeister, Donald F. (U. Ill.) THE SILKY POCKET MOUSE, PEROGNATHUS FLAVUS, IN ARIZONA, WITH A DESCRIPTION OF A NEW SUBSPECIES. Proc. Biol. Soc. Wash. 69: 55-58, map. May 1956.

Maps and states ranges of all 5 ssp. in Ariz. and describes P. f. goodpasteri, ssp. nov.

Jackson, Howard E. THE MYSTERY OF THE MIMA MOUNDS. Nat. Hist. 65(3): 136-139, 162, 6 figs. Mar. 1956.

Mima mounds, often attributed to work of pocket gophers, are here interpreted, in accordance with studies of Arthur M. Ritchie and others, as caused by action of water on partially thawed polygons of earth that were frozen during last Ice Age.

Klimstra, Willard D., and Thomas G. Scott. (S. Ill. U.) DISTRIBUTION OF THE RICE RAT IN SOUTHERN ILLINOIS. Chi. Acad. Sci., Nat. Hist. Misc. no. 154. 1-3 p., 2 maps. Apr. 1956.

Includes maps showing range of Oryzomys palustris in Ill. and U. S.

Louch, Charles Dukes. THE RELATION BETWEEN POPULATION DENSITY AND ADRENO-PITUITARY ACTIVITY IN FREE-LIVING AND CONFINED POPULATIONS OF FIELD MICE (MICROTUS PENNSYLVANICUS). Ph. D. thesis, U. Wis. 129 p. 1955. [From abstract in Dissertation Abstracts 15(12).]

"...a direct relationship was found between population density and adrenocortical activity as evidenced by increased adrenal weights and decreased blood eosinophil levels. In the field study drought conditions were also found to be correlated with increased adrenocortical activity. The demographic mechanisms that appeared to control population density in the confined populations were an increased litter mortality, brought about mainly by aberrant maternal behavior, and an increased adult mortality that was related to a high incidence of disease at high population densities. The major single factor that acted as a stressor appeared to be a high intensity of fighting, marked by the high proportion of wounded animals that occurred at high population densities. This fighting was probably induced by an increased irritability on the part of the animals due to their inability to remove themselves from repeated contacts with other animals." Physiological bases of these phenomena are considered. "The possibility is discussed that the response of the adrenocortical system to high population densities may be a basic factor in bringing about the sharp declines characteristic of certain cyclic mammalian populations."

Orr, Howard Dennis. RANGING ACTIVITY OF THE NORTHERN WHITE-FOOTED MOUSE, PEROMYSCUS LEUCOPUS NOVEBORACENSIS FISCHER, IN ITS NATURAL HABITAT. Ph. D. thesis, U. Pittsburgh. 96 p. 1955. [From long abstract in Dissertation Abstracts 16(1).]

Experimental study of mice in large pens. Considers effect on activity of temperature, barometric pressure, humidity, time of day, length of day, numbers of individuals present, introduction of strange individuals, movement of shelter. Activity was greatest at about 40-50°F. Activity increased with relative humidity to saturation point, but fell off with precipitation. Activity did not increase with moderate rise in population of pen, but individuals changed

positions and more of space was used. "Subjects confined to small, screen cages were detected by subjects allowed to move freely. When introduced into an acclimated group of subjects, caged subjects increased activity and caused positional changes. From this it seemed apparent that individuals in natural populations of Peromyscus are aware of each other without actual encountering experience. Areas containing caged animals were interacted with in the same way as areas containing freely ranging ones."

Peterson, Randolph L. (Roy. Ont. Mus. Zool. & Paleo., Toronto.) PHENACOMYS EATEN BY SPECKLED TROUT. J. Mamm. 37(1): 121. Feb. 1956.
Phenacomys populations are said to have reached an unprecedented peak in parts of Quebec and Manitoba in 1953 and '54.

Schorger, A. W. (U. Wis.) ABUNDANCE OF DEER MICE IN TUSCOLA COUNTY, MICHIGAN, IN 1854. J. Mamm. 37(1): 121-122. Feb. 1956.
We usually think of Peromyscus populations as being pretty well regulated by natural factors and not reaching the extreme densities reported for certain other mice. Here is a record of deer mice reaching such plague numbers under pioneer conditions that they were superabundant and an enormous pest.

Snyder, Dana P. (U. Mass.) SURVIVAL RATES, LONGEVITY, AND POPULATION FLUCTUATIONS IN THE WHITE-FOOTED MOUSE, PEROMYSCUS LEUCOPUS, IN SOUTHEASTERN MICHIGAN. Misc. Publ. Mus. Zool., U. Mich. no. 95. 1-33 p., 3 figs. Jan. 1956.
Mice were live-trapped on 2 oak-hickory plots on the George Reserve over a period of nearly 2 years. Plots of 10 and 12 acres were trapped at 60-ft. intervals for 5-6 days each 2 weeks during the breeding season, less frequently during the non-breeding season. Seasonal fluctuations in numbers, seasonal disappearance rates for different age groups, and winter mortality rates are calculated and graphed. These data were the principal object of the study. Data on and discussions of trapping efficiency, longevity, and method of age estimation are also of interest. Population densities were relatively low throughout, in comparison with other work on the reserve, and the number of mice that missed being caught in a given period but were retaken later is higher than usually found in studies of Peromyscus leucopus. Data on travels of mice would have been of interest in view of these variations.--L. F. Stickel.

Tanaka, Ryo. (Kochi Women's College, Japan.) YEARLY CHANGE IN SIZE AND STRUCTURE OF A CLETHRIONOMYS-POPULATION IN HOKKAIDO. Jap. J. Ecol. 4(2): 51-55, 3 figs. July 1954.
Japanese with English summary. Population density, turnover, survival, and changes in home ranges in a peat-bog grassland population of Bedford's vole (Clethrionomys rufocanus bedfordiae).--L. F. Stickel.

Tanaka, Ryo. FLUCTUATION IN VOLE POPULATIONS FOLLOWING THE WIDESPREAD SYNCHRONOUS FLOWERING OF BAMBOO-GRASSES ON MT. TURUGI. Bul. Kochi Women's Coll. 4(2): 61-68, 3 figs. Mar. 1956.
In English. Populations of Smith's vole (Clethrionomys smithi) reached over twice normal numbers in an area of bamboo-grass seed production. Periodic bamboo seed production is reviewed in relation to periods of rodent abundance with the conclusion that the two are related but not invariably synchronous.--L. F. Stickel.

Tanaka, Ryo. ON DIFFERENTIAL RESPONSE TO LIVE TRAPS OF MARKED AND UNMARKED SMALL MAMMALS. Annotationes Zoologicae Japonienses 29(1): 44-51, 2 figs. Mar. 1956.
In English. Statistical analysis of the problem with examples from several commensal and feral rodents.--L. F. Stickel.

Youngman, Phillip M. (U. Kans.) A POPULATION OF THE STRIPED FIELD MOUSE, APODEMUS COREAE, IN CENTRAL KOREA. J. Mamm. 37(1): 1-10, 4 figs. Feb. 1956.
Live-trap study. Habitat, numbers, transients, breeding, home range.

RATTUS AND MUS

Bentley, E. W., A. H. Bathard, and L. E. Hammond. (Min. Agr., Tolworth, Surrey, Eng.) SOME OBSERVATIONS ON A RAT POPULATION IN A SEWER. Ann. Applied Biol. 43(3): 485-494, 5 figs. Sept. 1955.
Study of control by prebaiting and poisoning.

Tanaka, Ryo. (Kochi Women's Coll., Japan.) COMMUNITY ECOLOGY ON THE RAT PLAGUE IN THE COASTAL REGION OF UWAJIMA, SOUTH-WEST OF SHIKOKU. Bul. Kochi Women's Coll. 4(1): 23-32, 6 figs. Dec. 1955.
Japanese with English summary. Account of outbreaks of Norway rats: estimates of numbers, effect of control operations, and damage to crops. Populations are estimated to have reached 90-2100 per ha. Poisoning with Warfarin killed an average of as many as 24 per house. Large populations, 7-11 per house, remained after poisoning.--L. F. Stickel.

SCIURIDS

Barkalow, Frederick S., Jr. (N. C. State Coll.) SCIURUS NIGER CINEREUS LINNE NEOTYPE DESIGNATION. Proc. Biol. Soc. Wash. 69: 13-17, 1 fig. May 1956.
Includes good description, tabulated measurements, and range statement for Bryant's fox squirrel, which now occurs only on eastern shore of Md.

Durrant, Stephen D., and Richard M. Hansen. (U. Utah.) DISTRIBUTION PATTERNS AND PHYLOGENY OF SOME WESTERN GROUND SQUIRRELS. Syst. Zool. 3(2): 82-85, map. June 1954.
Brief discussion of distribution, habitat preferences, distributional history, and relationships of Citellus armatus, beldingi, columbianus, richardsoni, and townsendii.

Hansen, Richard M. (Colo. A & M Coll.) DECLINE IN TOWNSEND GROUND SQUIRRELS IN UTAH. J. Mamm. 37(1): 123-124. Feb. 1956.
"These data also support the hypothesis that 'die offs' can completely exterminate populations in large areas." Recovery has not occurred after 18 years. Suspected cause is sylvatic plague.

Keith, James O. THE ABERT SQUIRREL AND ITS RELATIONSHIP TO THE FORESTS OF ARIZONA. Master's thesis, U. Ariz. vii + 106 p. 1956.

Moore, Joseph Curtis. (Am. Mus. Nat. Hist., N. Y.) VARIATION IN THE FOX SQUIRREL IN FLORIDA. Am. Midl. Nat. 55(1): 41-65, 7 figs. Jan. 1956.
Good study of individual and geographic variation. Emphasis is on coloration and skull measurements. Three races are recognized: S. n. niger from West Fla.; S. n. shermani (new) from most of Fla.; and S. n. avicennia from sw. Fla. Useful key and maps simplify identification. Five color phases are described.

Panuska, Joseph A., and Nelson J. Wade. (St. Louis U., Mo.) THE BURROW OF TAMIAS STRIATUS. J. Mamm. 37(1): 23-30, 5 figs. Feb. 1956.
Study of 30 burrow systems at Waupaca, Wis.

Vizoso, Monica Shorten, and F. A. Courtier. (Min. Agr., Tolworth, Surrey, Eng.) A POPULATION STUDY OF THE GREY SQUIRREL (SCIURUS CAROLINENSIS) IN MAY 1954. Ann. Applied Biol. 43(3): 494-510, 7 maps. Sept. 1955.
Squirrels were live trapped, marked, and shot in a semi-isolated, 46-acre woods in Eng. Live trapping was done for 9 days. Intensive shooting followed, accompanied by destruction of leaf nests and dens. Census method comparisons were made. Population was estimated to be about 5 per acre. Travels are tabulated and discussed. Adult ♂♂ traveled most, young the least. Sex ratio was 100 ♂♂ to 122 ♀♀. Breeding data are detailed. Juveniles and spring young formed 60% of population. Average number of placental scars was 3.26 for adults, 2.27 for juveniles. Estimated maximum number of spring young born to the population was 190. Notes are given on molt.--V. F. Flyger.

Huey, William S., and William H. Wolfrum. (N. M. Dept. Game.) BEAVER-TROUT RELATIONS IN NEW MEXICO. Prog. Fish-Culturist 18(2): 70-74, 2 figs. Apr. 1956.

"All the data from the investigation point to increased trout production in beaver ponds. The fact that the ponds produced a significantly greater number of trout per linear stream area, coupled with the fact that growth was slightly better in the ponds, indicates a much greater volume of production in these areas than in undisturbed stream areas. It is also significant that the non-beaver section which produced almost 60 percent more trout than either of the other such sections contained the remains of past beaver activity." Data are detailed and explanations of the findings are given.

Huey, William S. (N. M. Dept. Game.) NEW MEXICO BEAVER MANAGEMENT. N. M. Dept. Game & Fish, Bul. no. 4. iv + 49 p., 27 figs. 1956.

Useful, informative, well illustrated bulletin. Practically all suitable habitat in N. M. now has beaver. Population in state is about 7,000. Public harvest was 305 in 1953 (when season was opened), 405 in 1954. Peak of pelt primeness extends Jan.-Mar. Beaver waters have far more and slightly larger trout than have comparable non-beaver waters. A good study on this is reported. Of beaver repellents tested, best is 10% trinitrobenzine-aniline in acetone with arachlors; it gave trees reasonable protection for 3-4 months. Structures of concrete, pipe, and fencing that were developed are 80-90% effective in preventing travel up and down stream but permit debris to pass through. Long, perforate, fiber pipes run through dams are good regulators of pond levels. To judge from statistical analysis of 36 sets of embryos, av. litter size is 4.2 in aspen areas, 2.75 in cottonwood areas, and 2.06 from overused habitats. Willows were planted along a stream that lacked beaver and beaver foods. Survival was about 25% despite some browsing by cattle. "These results indicate that under normal use by livestock it may be estimated that in five to ten years this type of development will support an introduction of beavers." Other topics taken up include: history of beaver in state, size and management status of local populations, pelt prices 1938-55, results of opening season for public trapping, and instructions for pelting and trapping.

Symington, D. F., and R. A. Ruttan. (Sask. Dept. Nat. Resources.) BEAVER IN SASKATCHEWAN. Sask. Dept. Nat. Resources, Cons. Bul. no. 1. 1-18 p., 9 figs. No date. Rec'd. May 1956.

First of a series of semitechnical bulletins intended to provide community leaders in conservation with a sound basis for thinking. The paper seems well geared to this purpose. It has a suitable amount of natural history, and this is based in part on local conditions and observations. "Engineering" and "Relationship to Environment" are discussed interestingly with reference to conditions in Sask. "Management" tells how beavers were increased from scarcity to abundance within a few years through a program involving participation of provincial and dominion governments and trappers' councils. It points out the great importance of beaver trapping in the economy of the Northland and the damage beavers can do in the settled, agricultural s. of Sask. Regulations have been liberalized as beavers increased, but there are still areas where heavier trapping is needed to control or prevent overpopulations that would be bad both for beavers and the land. Studies must be continued to locate trouble spots before they become serious. Management must remain flexible and supported by informed public opinion.

Yeager, Lee E., and Keith G. Hay. (Colo. A & M Coll.) A CONTRIBUTION TOWARD A BIBLIOGRAPHY ON THE BEAVER. Colo. Dept. Game & Fish, Tech. Bul. no. 1. ii + 103 p., mimeo. Paper bound. Sept. 1955.

Comprehensive bibliography of hundreds of titles on all topics pertaining directly to beavers, living or fossil, foreign or American. Titles are arranged under 38 subject headings and an author index is provided. The authors state that they have omitted many popular papers and some faunal lists and probably have missed a number of foreign references, but certainly their bibliography as it stands is one of the finest in the wildlife field.

MUSKRAT AND NUTRIA

Adams, William H., Jr. ECOLOGICAL STUDIES OF COASTAL MARSH IN THE VICINITY OF PRICE LAKE, ROCKEFELLER REFUGE, CAMERON PARISH, LOUISIANA. M. S. thesis, La. State U. xiv + 118 p. 1956.

Study of wild nutria in brackish marsh. 348 nutria were trapped, ear-tagged, and released in 1955. Of these, 75 were recaptured. 711 nutria were examined during 1955-56 trapping season. Adults varied in total length from 37 to 42 inches and from 14 to 17 lbs. Secondary sex ratio was 49 males to 51 females; tertiary sex ratio was 51.3 males to 48.7 females. Gestation period averaged 4 months. Mean litter size was 5.03. Sexual maturity was reached at about 3 months and av. total length of 25 in. Chief foods were cystergrass, roseau cane, California bulrush, and Olney three-square. Daily cruising range probably was less than 200 yards. Two nutria traveled 15 and 18.5 miles westward. There are 313 nutria fur farms in 35 counties of Calif. Promoters in Ore. are selling "purebred" breeders at $950 a pair. The 1955-56 commerical trapping season demonstrated that lack of established, fair price for pelts created a definite lack of interest on the part of the trappers.--W. H. Adams, Jr.

Lord, G. H., A. C. Todd, and C. Kabat. (Johnson & Johnson Res. Found., New Brunswick, N. J.) STUDIES ON ERRINGTON'S DISEASE IN MUSKRATS. I. PATHOLOGICAL CHANGES. Am. J. Vet. Res. 17(63): 303-306, 2 figs. Apr. 1956.

Necropsies were performed on 66 Wis. muskrats that died of the disease. Gross and microscopic pathology are described. Acute hemorrhagic, membranous enteritis and focal necrosis of the liver were characteristic.

Lord, G. H., A. C. Todd, C. Kabat, and H. Mathiak. (Johnson & Johnson Res. Found., New Brunswick, N. J.) STUDIES ON ERRINGTON'S DISEASE IN MUSKRATS. II. ETIOLOGY. Am. J. Vet. Res. 17(63): 307-310. Apr. 1956.

Tests were set up to determine causative organism whether virus or aerobic or anaerobic bacterium. "5) A gram-positive, sporeforming bacterium identified as a Clostridium sp. was found to be common to cultures and smears prepared from cases of the disease. 6) The disease was successfully reproduced in healthy muskrats by the use of pure cultures of the Clostridium and also by the use of various inoculums suspected of containing the organism or possibly products of its metabolism. The length of time that elapsed between exposure and death varied from three to fourteen days in experimental animals. 7) Body excretions of affected animals appear to play an important role in the transmission of Errington's disease."

Rawley, Edwin V. (Utah Dept. Game.) $$ NUTRIA ?? Utah Fish & Game Bul. 12(4): 6-7. April 1956.

Brings together information on releases and escapes of nutria in Utah. Apparently establishment did not occur. The paper also presents a brief compilation of facts about history and economic status of nutria in U. S.

RACCOON, RINGTAIL, COATI

Kilham, Lawrence, R. T. Habermann, and C. M. Herman. (Rocky Mtn. Lab., Hamilton, Mont.) JAUNDICE AND BILIRUBINEMIA AS MANIFESTATIONS OF CANINE DISTEMPER IN RACCOONS AND FERRETS. Am. J. Vet. Res. 17(62): 144-148, 1 fig. Jan. 1956.

"...distemper may be of importance as a cause of epizootics among wild carnivores, such as are known to reduce raccoon and skunk populations..." Summary: "1) Two strains of distemper virus have been isolated from wild raccoons and one strain from ferrets. 2) All strains isolated have induced bilirubinemia in raccoons and ferrets. Many raccoons with bilirubinemia also had jaundice. 3) Identification of these strains as members of the canine distemper virus complex has been by clinical and pathological findings consistent with this diagnosis as well as by cross-immunity tests." The raccoon virus previously termed RJV (see WR 76: 42) is here considered a strain of canine distemper virus.

MUSTELIDS

Ritcey, R. W., and R. Y. Edwards. (B. C. For. Serv., Victoria.) LIVE TRAPPING MINK IN BRITISH COLUMBIA. J. Mamm. 37(1): 114-116. Feb. 1956.
Summary and conclusions: "Mink have been found relatively easy to live trap, but a satisfactory marking method, suitable for use by one man under rough field conditions, has yet to be used. [Various types of ear tags were tried; results are detailed.] Until a more satisfactory method appears we intend to use mapping of ventral pelage pattern as described by McCabe [J. Mamm. 30: 415] and ear clipping to denote previous capture. Recapture data are too few to be conclusive. There is some indication, however, of movements up to two miles airline, of juveniles being more restricted in their travels than are adult males, and of adult females being most sedentary of all. A high proportion of juveniles in the data suggests a rather high rate of population turnover."

Shadle, Albert R. (U. Buffalo.) PARTURITION IN A SKUNK, MEPHITIS MEPHITIS HUDSONICA. J. Mamm. 37(1): 112-113. Feb. 1956.

Smith, J. Greg. (Wyo. Game Comm.) WILL THE DEVIL BEAST RETURN? Wyo. Wildl. 20(5): 20-25, 3 figs. May 1956.
Reports recent records of wolverine in Wyo. and summarizes knowledge of status in adjacent mtn. states. There is real hope that the wolverine is coming back in the n. U. S. Rockies. Certainly the animal is not extinct in Wyo., Idaho, and Mont.

Wildhagen, Aage. (Zool. Mus., Oslo, Norway.) PRESENT DISTRIBUTION OF NORTH AMERICAN MINK IN NORWAY. J. Mamm. 37(1): 116-118. Feb. 1956.
Mink have escaped from many fur farms and are established in the wild in many parts of Norway. They live much as they do in Am. Evidence as to their effects on sea bird colonies is contradictory. Mink seem to have depressed fish populations in some cultivated ponds. Mink populations seem to rise and fall with rodent populations. Escapees are not always able to establish themselves in the wild.

DOGS, WOLVES, FOXES

Barbour, Roger W., and Larry R. Gale. (U. of Ky.) A STUDY OF THE FOOD OF FOXES IN CENTRAL KENTUCKY. Trans. Ky. Acad. Sci. 16(4): 102-104. Dec. 1955.
Detailed report of stomach contents of 10 gray and 26 red foxes collected Sept. 1949 to July 1950.

Otter, H. VOM RICHTIGEN ANSPRECHEN DES FUCHSES. Der Anblick, Graz. No. 2, 1955. (Pages not stated.) [From abstract in Z. Jagdwissensch. 1(1).]
A detailed description of sex and age differences in appearance of red foxes in Europe.--D. E. Davis.

Pryor, Lorenzo. (Pa. Game Comm.) SARCOPTIC MANGE IN WILD FOXES IN PENNSYLVANIA. J. Mamm. 37(1): 90-93, 2 figs. Feb. 1956.
Incidence and distribution as determined from examination of 116,552 hides, 1946-49. Mange was found in 1.2% of red foxes but in almost no grays. Data suggest that incidence of mange may be closely related to density of fox population. Mortality is high among young foxes infected with mange; whole litters may perish at an early age. Mange-weakened foxes tend to turn to poultry as easy prey.

CATS

Comfort, Alex. (U. Coll., London W. C. 1, Eng.) MAXIMUM AGES REACHED BY DOMESTIC CATS. J. Mamm. 37(1): 118-119. Feb. 1956.
The author's own data and those of others indicate that cats are quite the longest-lived of all small domestic animals. There are numbers of records of cats more than 20 years old and some cats may live 27-31 years. One was reputed to have had kittens when 26 years old. Very few dogs live to the age of 20. The condition of aged dogs is far worse than that of aged cats.

CATS--Continued

Magnus, Lester T. (Minn. Dept. Cons., Roseau.) MOUNTAIN LION OBSERVATION IN LAKE OF THE WOODS COUNTY. Flicker 28(1): 43-44, 1 fig. Mar. 1956.
This observation in Minn. is attested to by 2 men and by the photo of tracks that is reproduced here.

Toner, G. C. (Bancroft, Ont.) HOUSE CAT PREDATION ON SMALL ANIMALS. J. Mamm. 37(1): 119. Feb. 1956.
Records of small mammals caught by pet cats, 1950-54. These cats did much hunting, preferring to catch their own food although fed 6 oz. of canned food per cat daily. Tamias and Microtus were staple wild fare.

BIG GAME, GENERAL

Anon. HARVEST '55. Wyo. Wildl. 20(3): 4-21, illus. Mar. 1956.
Data on Wyo. kills of big game in 1955 and table reporting kills of big game, by species, 1946-55. Total kill in 1955 "was about 2,000 head greater than the record harvest of 1954... A total of 94,632 big game animals were taken last year. These included an estimated 47,283 mule deer, 3,845 white tail deer, 33,090 antelope and 9,554 elk. The moose harvest was 580, black bear 227, grizzly bear 4, and mountain sheep 49... The harvest of Wyoming's big game animals seems to have reached a leveling-off point after several years. The number of animals killed each season increased rapidly between the end of the war and 1952. In 1952 the harvest reached 90,000. Since then it has increased, but at a much slower rate. Game managers feel that in many cases the limit has been reached on both the number of game animals various ranges will support and the size of the harvest."

Bandy, P. J., I. McT. Cowan, W. D. Kitts, and A. J. Wood. (U. of B. C.) A METHOD FOR THE ASSESSMENT OF THE NUTRITIONAL STATUS OF WILD UNGULATES. Can. J. Zool. 34(1): 48-52, 3 figs. Feb. 1956.
Abstract: "A study has been made of the relationship existing between heart girth and body weight and hind foot length and body weight of growing Columbian black-tailed deer (Odocoileus hemionus columbianus). From the results obtained, a method has been proposed for the assessment of the nutritional status of wild ungulates. This method involves a comparison of ratios of body weight estimated from heart girth to body weight estimated from hind foot length."

Cole, Glen F. (Mont. State Coll.) THE PRONGHORN ANTELOPE / ITS RANGE USE AND FOOD HABITS IN CENTRAL MONTANA WITH SPECIAL REFERENCE TO ALFALFA. Mont. Agr. Exp. Sta. (Bozeman), Bul. 516. 1-63 p., 12 figs. Feb. 1956.
Pronghorns of a 62,160-acre area were studied during warm seasons of 1953 and 1954. The area was chiefly rangeland, but 2,659 acres were in alfalfa. Cole describes rangeland types, antelope use of these types, food habits as determined from field observations and rumen samples, amount of use of alfalfa at different seasons, effects of antelope on alfalfa, characteristics of fences under which antelope did and did not crawl, composition of antelope groups, behavior of groups, and travels of individuals and groups. Serious damage to alfalfa was verified. Either-sex hunting beginning about Sept. 1 probably would reduce herds before heaviest use of alfalfa began. Groups generally occupy relatively small areas, so hunting concentrated in vicinity of fields should reduce number of antelope that habitually use fields. Fields that include little rangeland are relatively unattractive; hence fences should be as close to alfalfa as practicable. Fences with no more than 11 inches from ground to wire and between wires will exclude most antelopes. Some antelopes (only 1 in this study) learn to jump fences. These apparently have been stopped by a fence 4.5 ft. high.

Denver Wildl. Res. Lab. INVENTORY OF BIG-GAME ANIMALS OF THE UNITED STATES, 1954. US F&WS, Wildl. Leafl. 376. 3 p. Mar. 1956.
Useful compilation of estimated numbers and kills of each type of big game in each state, with totals for species and states. Wild turkey and 4 exotic ungulates are included. These summaries are interesting and valuable in many ways, but the user should bear in mind that the figures are mainly estimates and that states have followed different practices in reporting. Some states include counts on captive and refuge herds. By contrast, Texas does not even mention its Barbary sheep, blackbucks, and certain other exotics; Oklahoma claims no bison at all despite the large herd on the Wichita Refuge.

Gilbert, Paul F., and Ralph R. Hill. (Colo. Game Dept.) HEALING OF THE FRACTURED LEG BONE OF AN ELK. J. Mamm. 37(1): 129. Feb. 1956.
Bull elk about 2.5 years old apparently was recovering well from fracture of tibia caused by gunshot.

Gregg, Peter Alan. SUMMER HABITS OF WYOMING ANTELOPE. Ph. D. thesis, Cornell U. 185 p. 1955. [From long abstract in Dissertation Abstracts 15(12).]
Composition of groups and their seasonal changes, group behavior, feeding behavior, responses to weather, nursing, home range, sign-making, communication, leadership, aggressive behavior, breeding activities.

Ogren, Herman A. A POPULATION STUDY OF THE ROCKY MOUNTAIN BIGHORN SHEEP (OVIS CANADENSIS CANADENSIS SHAW) ON WILDHORSE ISLAND. M. S. thesis, Mont. State U. iii + 77 p., 8 figs., proc. Aug. 1954.
Study made on island in Flathead Lake, Mont. Topics include: productivity of herd, causes of lamb losses, survival of lambs, breeding pattern, characteristics and development of young, food habits, composition of bands throughout year, range condition, competition with other herbivores, incidence of lungworm. Productivity declined during study. Some lamb losses were attributed to spring rains followed by pneumonia. Survival was high each year for yearlings and for lambs over a week old. A form of monogamy was observed in the herd. If it prevails elsewhere, the practice of shooting enough ♂♂ to unbalance the sex ratio may be undesirable. Grasses were main foods year-around. Browse and forbs were important in spring. Range was overgrazed and eroding; food requirements of bighorns, deer, and horses present were 5 times proper range use. Light lungworm infestations in about 1/3 of herd apparently did not adversely affect reproduction.

DEER (Odocoileus)

Dasmann, Raymond F., and Richard D. Taber. (Humboldt State Coll.) DETERMINING STRUCTURE IN COLUMBIAN BLACK-TAILED DEER POPULATIONS. J. Wildl. Mgt. 20(1): 78-83. Jan. 1956.
A method of visual classification of natural populations of O. hemionus columbianus is described. The categories are: adult male, yearling male, adult female, yearling female, fawn. Criteria for distinguishing these are given. The best seasons for this are when the deer are in family groups--July and Dec., in the n. Coast Range of Calif. The best times of day are early morning and late evening of clear, calm days. This method permits determination of: (1) current year's natality, (2) previous year's fawn survival, (3) sex differences in fawn mortality.--R. D. Taber.

Eberhardt, Lee, and Robert C. Van Etten. (Mich. Dept. Cons.) EVALUATION OF THE PELLET GROUP COUNT AS A DEER CENSUS METHOD. J. Wildl. Mgt. 20(1): 70-74. Jan. 1956.
Pellet group counts were conducted on two Mich. areas of known deer populations in 3 years as a test of validity of the method for deer censusing. Differences between estimated and actual populations ranged from 2 to 53%, indicating presence of some serious systematic error in at least 1 case. Daily rates of pellet deposition were investigated, using about 40 penned deer. Average daily rate was 12.7 pellet groups per deer per day. Diet and age of deer had significant effects on daily rates but the variation was not great enough to be of practical importance. Differing rates of pellet deterioration, variation in leaf-fall dates, vegetative disturbance of pellet-groups, and observer errors are considered sources of possible systematic errors in use of the method.--Lee Eberhardt.

McCormack, Roger. (Idaho Game Dept.) THE OWYHEE COUNTY DEER HERD. Idaho Wildl. Rev. 8(5): 6-9, 9 figs. Mar.-Apr. 1956.
Mule deer were protected in Owyhee Co., Idaho, for a few years and then the season was opened only bit by bit. Deer increased beyond carrying capacity, overbrowsed the range. Finally, in 1955, a kill of some 5,000 was attained--about equal to recruitment. Better distribution of hunters and kill is badly needed; special seasons may be the answer. Tables show age composition of deer bagged and report hunting statistics for 1951-55.

DEER (Odocoileus)--Continued

Symington, D. F., and W. A. Benson. (Sask. Dept. Nat. Resources.) WHITE-TAILED DEER IN SASKATCHEWAN. Sask. Dept. Nat. Resources, Cons. Bul. no. 2. 1-18 p., 9 figs. No date. Rec'd. May 1956.

Incredibly, sales of deer-hunting licenses in Sask. have risen ten-fold in the last decade, yet heavier hunting is needed to keep the herd under control. "Thinking must be in terms of an annual harvest of 100,000 deer rather than the totally inadequate 20,000-odd of recent years." There are probably 800,000 to 1,000,000 whitetails in the 100,000 sq. mi. they occupy in Sask. Hard winters such as those of 1955-56 and 1947-48 cause much mortality, but the results are temporary as well as undesirable. Heavier hunting is necessary to keep the herd vigorous and to prevent spread of lasting habitat destruction and severe injury to crops. This popular bulletin presents the case simply, clearly, and strongly. It also tells of the numbers of whitetails per sq. mi. in the major habitats of Sask. and discusses natural history and food requirements in interesting fashion.

MAMMALS--MARINE

King, Judith E. (Brit. Mus.) THE MONK SEALS (GENUS MONACHUS). Bul. Brit. Mus. Nat. Hist., Zool. 3(5): 201-256, 12 figs. + 6 plates. Jan. 1956. 18s.

The monk seals, almost unique in being seals of warm waters, are now relatively scarce and restricted in distribution. The West Indian species is near extinction. Status and abundance are among subjects discussed in this revision. Synopsis: "An account is given of the history, distribution, features and habits of the three species of monk seal Monachus monachus, M. tropicalis and M. schauinslandi. A list is given of the skulls, skeletons, skins and stuffed animals that have been examined. The skull, dentition and skeleton are described and compared with those of other Phocidae. The members of the genus Monachus are shown to be much more nearly allied to the Southern than the Northern Phocids. The relative growth rates of the various parts of the skull are given, and show that the facial region grows more quickly than the cranial region."

Manzer, J. I., and I. McT. Cowan. (Pac. Biol. Sta., Nanaimo, B. C.) NORTHERN FUR SEAL IN THE INSIDE COASTAL WATERS OF BRITISH COLUMBIA. J. Mamm. 37(1): 83-86. Feb. 1956.

Analysis of recent records. Considers apparent increase in frequency.

Paulian, Patrice. SUR L'ÂGE ET LA CROISSANCE DU LÉOPARD DE MER HYDRURGA LEPTONYX (DE BLAINVILLE). Mammalia 19(2): 347-365, illus. June 1955. [From J. Mamm. 37(1).]

Rand, R. W. (Box 251, Cape Town, S. Africa.) NOTES ON THE MARION ISLAND FUR SEAL. Proc. Zool. Soc. London 126(1): 65-82, 4 figs. + 2 plates. Jan. 1956.

The seals are described, compared and tentatively identified as Arctocephalus gazella. Data are given on numbers, foods, breeding, molt, and lack of prospects for profitable sealing.

Siebenaler, J. B., and D. K. Caldwell. (The Living Sea, Ft. Walton Beach, Fla.) COOPERATION AMONG ADULT DOLPHINS. J. Mamm. 37(1): 126-128, 1 fig. Feb. 1956.

Several examples of apparently purposeful cooperation or assistance.

MAMMALS--OTHER GROUPS

Higginbotham, A. C., and W. E. Koon. TEMPERATURE REGULATION IN THE VIRGINIA OPOSSUM. Am. J. Physiol. 181(1): 69-71. April 1955. [From J. Mamm. 37(1).]

MAMMALS--OTHER GROUPS--Continued

Pimentel, David. (Pub. Health Serv., San Juan, P. R.) THE CONTROL OF THE MONGOOSE IN PUERTO RICO. Am. J. Tropical Med. & Hygiene 4(1): 147-151. Jan. 1955.

Sun-dried fresh fish was good bait. Various poisons were tested in laboratory. Only 1080 and thallium sulfate were effective. Thallium was field tested. In one test it gave about 90% reduction of mongooses at cost of about 17¢ per acre. In test on a small island, it seemed to kill all adults but some young survived. Cost was about 76¢ per acre.

BIRDS--GENERAL

Dennis, John V. (17 Liberty St., Nantucket, Mass.) EXPERIMENTS WITH THE ALL-PURPOSE TRAP. Bird-Banding 26(4): 152-159. Oct. 1955.

Effect of habitat of placement, bait, weather, etc. on effectiveness of this trap. Useful for banders of small birds.

Morrison, Kenneth D. (Natl. Aud. Soc., 1130 5th Ave., N. Y. 28.) BIRD PROTECTION LAWS SHOW PROGRESS. Aud. Mag. 57(5): 222-225. Sept.-Oct. 1955.

Includes useful list of U. S. states and Canadian provinces showing what birds are not protected in each. The data came from game departments.

Pettingill, Olin Sewall, Jr. A LABORATORY AND FIELD MANUAL OF ORNITHOLOGY. Burgess Publ. Co., Minneapolis 15, Minn. viii + 379 p., illus. Revised ed. 1956. $5.00, cloth.

A large (8.5 x 11 x 1.25 in.), impressive work. It is a combination of text and study guide. As such it should be extremely useful to all but advanced ornithologists. Even they will find it handy for the hundreds of references it cites. The present 3d edition incorporates extensive revisions. Twenty well-organized chapters and 7 appendixes give a great deal of information on internal and external structure, function, classification, identification, distribution, migration, ecology, communities, populations, territories, song, life history, and bibliography. Good instructions and sample forms are given for laboratory and field work of many kinds. So much material is included on so many topics that the author advises teachers to assign sections selected to suit length and emphasis of courses. Use of this book will give a student an excellent factual background and an introduction to a wide body of important literature. Up-to-dateness of material and references is a welcome feature. Illustrations are numerous, large, clear drawings by W. J. Breckenridge. The book is beautifully produced by offset on good sturdy paper.

Section of Distribution of Birds and Mammals. BIRD BANDING. US F&WS, Wildl. Leafl. 373. 1-9 p. Jan. 1956.

"This leaflet is a slight revision of WL-235 (November 1951)." Gives a general, popular account of banding and tells how the Am. banding program operates.

Sibley, Charles G. (Cornell U.) ORNITHOLOGY. In A Century of Progress in the Natural Sciences 1853-1953. Calif. Acad. Sci. p. 629-659. 1955.

History of ornithology. Sections deal with systematics and evolution, anatomy and classification, migration, behavior, fossils, periodicals, and monographs.

Tinbergen, Niko. BIRD LIFE. Oxford U. Press, London. 64 p., illus. 1954. 8s. 6d. net. [From long review by M. M. Nice, Bird-Banding 26(3).]

"This is a book designed for beginners, one of the Oxford Visual Series, in which 'text and illustration are of equal importance.' In simple words, with a wealth of his own sketches and photographs, Dr. Tinbergen gives us the essence of bird biology. Through vivid descriptions of actual experiences with birds the subject of each chapter is made alive; then it is amplified by comparisons with the behavior of other species. After chapters on movements, feathers, song, fighting, courtship, nest building, and incubation we join the author in watching families of Herring Gulls, Hobbies, and Great Tits. Some other chapters of particular interest are on 'Why Do Birds Behave as They Do?' and 'The "Language" of Birds.' ...the book is always pointing the way as to how the reader can observe for himself and add to our knowledge... A wonderful book that will delight and inform not only beginners, but all students of nature."

BIRDS--GENERAL--Continued

Welker, Robert E. BIRDS AND MEN. Harvard U. Press. 230 p., illus. 1955. $5.75. [From review by Herbert Friedmann, Atl. Nat. 11(4).]

"This book deals...with men who dealt with birds as the subject of their writing, painting, observation, study, or even legislation... The degree to which Mr. Welker's coverage, analysis, and critical evaluation may seem valid or even adequate will undoubtedly differ among different people reading the book, but it is safe to say that all will derive some pleasure and satisfaction from the work... On the whole, the accounts of the painters of birds, especially Wilson and Audubon, are more fully worked out as critiques than are those dealing with the writers, who include in their list such a variable, and literarily uneven, assemblage as Thoreau, Emerson, Burroughs, Muir, Whitman, and T. Roosevelt. The book is well written, with an engaging style..."

BIRDS--MORPHOLOGY, PHYSIOLOGY, BEHAVIOR, MIGRATION

Allen, William H. (Res. Studies Inst., Maxwell Air Force Base, Ala.) [CRITIQUE OF "BIRD NAVIGATION," BY G. V. T. MATTHEWS, 1955.] Bird-Banding 27(1): 48-50. Jan. 1956.

Allen, meteorologist and navigator, gives a long and penetrating review of Matthews' account of the sun-arc hypothesis (see WR 83: 41) and concludes at a number of points, "Not proven."

Blake, Charles H. (Mass. Inst. Tech.) WEIGHT CHANGES IN BIRDS. Bird-Banding 27(1): 16-22. Jan. 1956.

How great the changes are, factors affecting weights, how weights should be determined and expressed.

Bonham, Lewis L., and Lamont V. Blake. (Corvey Engineering Co., Alexandria, Va.) RADAR ECHOES FROM BIRDS AND INSECTS. Sci. Monthly 82(4): 204-209, 3 figs. Apr. 1956.

Demonstrates that birds and insects do give radar echoes and discusses the phenomena in some detail. Should be of interest to those studying birds by radar.

Gandal, Charles P. (Bronx Zoo., N. Y.) SATISFACTORY GENERAL ANESTHESIA IN BIRDS. J. Am. Vet. Med. Assn. 128(7): 332-334. Apr. 1956.

Several preparations were evaluated and found to have drawbacks. But "In 122 clinical and experimental trials on birds ranging from canaries to peacocks, safe, satisfactory surgical anesthesia was readily induced using intramuscular injections of equithesin at a dosage of 2.5 cc. per kilogram of body weight." "Equithesin is produced by Jensen-Salsbery Laboratories, Kansas City, Mo. Each 500 cc. contains 21.3 Gm. of chloral hydrate, 4.8 Gm. of pentobarbital, and 10.6 Gm. of magnesium sulfate in aqueous solution of propylene glycol with 9.5 per cent alcohol."

Hoffmann, Klaus. STUDIES ON THE INTERNAL TIME-SENSE IN BIRDS IN RELATION TO ORIENTATION. Z. Tierpsych. 11(3): 453-475. 1955. [Abstract by M. M. Nice, Bird-Banding 26(4).]

In German. "Three hand-raised Starlings were trained to definite compass directions; in one bird this training was found to last 10-1/2 months. 'A central nervous mechanism must be postulated to allow for diurnal changes in the sun's azimuth position. An "internal clock" must be one of the basic components of this mechanism.' Experiments were made with different 'artificial days.' 'Throughout a period of 28 days with constant light and approximately constant temperature the choice of compass direction did not vary, though the activity rhythm seemed to be greatly upset.' This important study from Dr. Kramer's laboratory presents 21 charts and an extensive bibliography."

Kramer, Gustav. A FURTHER EXPERIMENT TO INFLUENCE THE ORIENTING OF CARRIER PIGEONS BY THE SEASONAL CHANGE OF THE SUN ALTITUDE. SIMULTANEOUSLY A CRITIQUE OF THE THEORY OF THE EXPERIMENT. J. Ornith. 96(2): 173-185. 1955. [Abstract by O. L. Austin, Jr., Bird-Banding 26(4).]

German with English summary. "To check the discrepancies between the results of the Matthews and Rawson experiments...the author repeated the experiment in

1954 at Wilhelmshaven. The results were again negative and failed to support the sun navigation hypothesis. He suggests possible explanations of the conflicting results between the Cambridge and Wilhelmshaven experiments, and attempts a further clarification of some of the astronomical and psychological technicalities involved in the proposed theory."

Kramer, Gustav, J. G. Pratt, and Ursula von St. Paul. (Max-Planck-Inst., Wilhelmshaven, Germany, and Duke U., N. C.) DIRECTIONAL DIFFERENCES IN PIGEON HOMING. Science 123(3191): 329-330, 1 fig. Feb. 24, 1956.

Tests at varying distances and with different directions revealed that homing was faster and surer when from the south. Results are considered unfavorable to the theory of orientation by means of random searching and use of landmarks.

Novrup, Leo. GOATSUCKER FOUND IN STATE OF HIBERNATION. Dansk Ornith. Forenings Tidskrift 50(1): 77-79, illus. 1956.

In Danish. A goatsucker was found lying on a tuft of moss in Denmark in morning of Mar. 22, 1955 when temperature was below freezing. The bird was relaxed and cold and was believed dead. After being carried about in the hand for 1/2 hr. it began to move its toes slightly. Brought into a warm room, it was able to raise its head at 6:15 am., spread its wings at 6:35 and unsuccessfully attempted to fly at about 7 am. By 9 am it was able to fly well. Author notes that goatsuckers do not trill when surrounding air is below 4°C. He believes that below this point the birds loose heat rapidly and enter a torpid state.--V. F. Flyger.

Pastore, N. LEARNING IN THE CANARY. Sci. Am. 192(6): 72-79. 1955. [From Auk 73(1).]

"Canaries were found able to respond to perceptual and spacial relationships and capable of insightful or conceptual behavior in the experiments where they had to respond properly to various configurations of objects or move objects to obtain a standard food reward. Pastore concludes either that the brain cortex of a bird is capable of more complex performances than has generally been conceded or that its subcortical centers can carry on complex activities usually assigned to the cortex."

Rawson, Kenneth S. SUN COMPASS ORIENTATION AND ENDOGENOUS ACTIVITY RHYTHMS OF THE STARLING (STURNUS VULGARIS L.) Z. Tierpsych. 11(3): 446-452. 1954. [From abstract by M. M. Nice, Bird-Banding 26(4).]

Apparently in English.

Rawson, Kenneth S., and Anne M. Rawson. THE ORIENTATION OF HOMING PIGEONS IN RELATION TO CHANGE IN SUN DECLINATION. J. Ornith. 96(2): 168-172. 1955. [Abstract by O. L. Austin, Jr., Bird-Banding 26(4).]

English with German summary. "Reviews briefly Matthews' sun navigation hypothesis and his sun occlusion experiment at Cambridge in support of it, and describes a similar experiment carried out at Wilhelmshaven in 1953, the results of which 'are not in agreement with those of Matthews and do not support his sun navigation hypothesis.'"

Roberts, N. L. (Beecroft, Sydney, Australia.) A SURVEY OF THE HABIT OF NEST-APPROPRIATION. Emu 55(2): 110-126 and 55(3): 173-184. May & Sept. 1955.

This review of nest appropriation by birds is on a world basis with special reference to Australia.

BIRDS--MANUALS, FAUNAS, COMMUNITIES

Fables, David G., Jr. (Roselle Park, N. J.) ANNOTATED LIST OF NEW JERSEY BIRDS. Urner Ornithological Club [N. J. Aud. Soc., 796 River Rd., New Milford, N. J.] xi + 95 p., maps, graphs, sketches. 1955. $2.50, cloth.

The list discusses general status, distribution, and seasonal occurrence of each species. Subspecies are considered when more than one occurs in N. J. Bar graphs give data on peak of seasonal occurrence of each species. A brief introduction takes up the ecological regions of N. J. and their characteristic birds. Hypothetical list, checklist, and index complete the volume.

Ford, Edward R. BIRDS OF THE CHICAGO REGION. Chicago Acad. Sci., Spec. Publ. no. 12. viii + 117 p., 2 photos of author, 1 map. 1956.

Long annotated list that gives information on abundance, migration dates, breeding dates, and important records. Includes hypothetical list, 10-page bibliography, and index. Foreword and biographical sketch of author are by H. K. Gloyd, who, with the aid of several ornithologists, undertook the laborious task of preparing the rough MS of this paper for posthumous publication. The Chicago Region, as here defined, includes Berrien Co., Mich., 6 counties in Ind., 9 counties in Ill., 3 counties in Wis., and adjacent waters of Lake Mich.

Grimm, William C. BIRDS OF THE PYMATUNING REGION. Pa. Game Comm. vi + 226 p., illus. 1952. Paper cover.

Sutton's work of 1928 described the avifauna before most of the Pymatuning swampland was flooded. Today the region is important to waterfowl and contains a large refuge as well as hunting lands, forests, marshes, abandoned fields, crop land, and recreational developments. Grimm's book brings out the changes in the area and its bird life. It describes the area and its history, ecology of major habitats, and climate. It lists breeding birds and winter birds. Bar graphs show seasonal distribution of each species. Results of waterfowl banding are tabulated in detail. Most of the book consists of a lengthy annotated list of birds of the 450-sq. mi. region that includes Pymatuning. Species accounts in this list treat past and present status, migration, and breeding records. The book is documented, indexed, well printed, and is illustrated with numerous sketches, photographs, and color plates.

Griscom, Ludlow, and Dorothy E. Snyder. (MCZ, Harvard U.) THE BIRDS OF MASSACHUSETTS / AN ANNOTATED AND REVISED CHECK LIST. Peabody Mus. (Salem, Mass.). 295 p. 1955. $4.95, cloth; $3.75, paper. [From long review by Roger T. Peterson, Bul. Mass. Aud. Soc. 40(3).]

An annotated checklist prepared by exceptionally critical standards. The next writer on the birds of Mass. "will not find it necessary to go farther back than Griscom and Snyder. They have outlined criteria for the acceptance of sight records, closely following the rules adopted recently by the New York State Bird Book Committee of the Federation of New York State Bird Clubs. However, for every bird officially on the State list they require a specimen, a banding record by a reputable ornithologist or a recognizable photograph on file and readily available for examination. All other reported forms have been placed on the Hypothetical List without regard to the observer... Perhaps the unique feature in the present work is the brief listing at the end of each species account of all the known Massachusetts specimens in the museums of the State." The book also includes "analyses of the trends, the increases and declines over a century, and the probable causes of these changes in population."

Hickey, Joseph J. (U. Wis.) NOTES ON THE SUCCESSION OF AVIAN COMMUNITIES AT ITASCA PARK, MINNESOTA. Flicker 28(1): 2-10, 1 fig. Mar. 1956.

Discusses response of birds to aquatic plant successions and effect of forest fires on bird communities. It also provides census data for birds of aspen and pine areas. "The succession of birdlife as fields revert to brush and proceed through an aspen series evidently involves progressively higher densities of birds as well as an increase in the number of species."

Lippens, L. LES OISEAUX D'EAU DE BELGIQUE. E. Vercruysse-Vanhove, Saint André-lez-Bruges. 302 p., 9 figs., 24 col. pls. 1954. 285 Belg. Fr. [From review by D. W. S., Ibis 98(1).]

"A concise and well-presented handbook of the water birds, both fresh-water and marine, of Belgium. The information on each species is given in four sections, dealing with: geographical distribution, in Belgium and elsewhere; morphological and field characters, habitat and general behavior; nidification; and migration... The protection and study of birds have advanced remarkably in Belgium since the war, and this book should satisfy a real need."

Marshall, Joe T., Jr. (U. Ariz.) SUMMER BIRDS OF THE RINCON MOUNTAINS, SAGUARO NATIONAL MONUMENT, ARIZONA. Condor 58(2): 81-97, 12 figs. Mar.-Apr. 1956.

Good account of topography and habitats of area and much information on habitat distribution of birds. Geographic variation in creeper and house wren is discussed.

Mowat, Farley M., and Andrew H. Lawrie. (Toronto, Ont.) BIRD OBSERVATIONS FROM SOUTHERN KEEWATIN AND THE INTERIOR OF NORTHERN MANITOBA. Can. Field-Nat. 69(3): 93-116, map. July-Sept. 1955.

Detailed, annotated list of 124 species. Based on prolonged field work in 3 years, 1947-49.

Nelson, Theodora. (Hunter Coll., N. Y.) THE HISTORY OF ORNITHOLOGY AT THE UNIVERSITY OF MICHIGAN BIOLOGICAL STATION. Burgess Publ. Co., Minneapolis 15, Minn. xvi + 106 p., 1 photo, 2 maps. 1956. $3.00, paper.

This book has far wider value than its title may suggest. The history of the station is told in 5 p. and the history of its bird work in 8 p. Much of the book, 68 p., consists of an annotated bird list for the Douglas Lake Region, which includes parts of several counties near Cheboygan, Mich. Annotations are based on nearly 50 years of study. They cover seasonal status, breeding data, outstanding records, and occasionally include natural history notes. Thirteen p. are required to list the scores of student reports on bird studies made at the station. Many of these were substantial and all are still on file. A list of publications based on bird work at the station occupies 4 p. Other publications of special interest in connection with ornithology of the region, or with station history, are listed separately. A 7 p. gazetteer of local place names facilitates use of the book, as does the species index. To former stationites, the most nostalgic section may be the 2-1/2 p. account of "Bird Trip Breakfast," in which menus and equipment are listed and instructions are given for outdoor cooking of what they can attest is excellent bacon and coffee in quantities sufficient for a big gang of hungry students.

Rand, A. L., and M. A. Traylor. MANUAL DE LAS AVES DE EL SALVADOR. Universidad de El Salvador. 308 p., numerous line drawings. Processed. 1954. Not priced. [From review by R. E. M., Ibis 98(1).]

"With only 393 species in its 13,000 square miles, El Salvador is notably poorer than Costa Rica, with 753 in 23,000. The difference is attributed to lack of wet forest in El Salvador. Almost the whole volume consists of the list of species, each of which is described, with brief notes on its range and biology."

Stephens, T. C., Wm. G. Youngworth, and Wm. R. Felton, Jr. THE BIRDS OF UNION COUNTY, SOUTH DAKOTA. Nebr. Ornith. Union, Occ. Pap. no. 1. 35 p. 1956? 75¢ from Wm. F. Rapp, Jr., 430 Ivy Ave., Crete, Nebr.

Tordoff, Harrison B. (U. Kans.) CHECK-LIST OF THE BIRDS OF KANSAS. U. Kans. Publ., Mus. Nat. Hist., 8(5): 307-359, 1 map. Mar. 1956.

Gives scientific and common names, indicates status in state, cites the more important records, and tells what subspecies occur in state. Species not represented by collected specimens are placed on hypothetical list and entries for them are enclosed in brackets. The paper has index but no bibliography.

Voous, K. H. DE VOGELS VAN DE NEDERLANDSE ANTILLEN: BIRDS OF THE NETHERLANDS ANTILLES. Martinus Nijhoff ('s Gravenhage) for the "Foundation for Scientific Research in Surinam and the Netherlands Antilles." viii + 205 p., 22 col. pls., 9 photos, maps. 1955. Fl. 8. [From review by R. E. M., Ibis 98(1).]

"The islands dealt with comprise the dry Aruba-Curacao-Bonaire group off the South American coast and the still smaller, but more mountainous, islands of St. Martin, St. Eustatius and Saba in the Windwards. Accounts are given of the habitats and birds of each island and a brief chapter on migration. 147 species are dealt with individually, recognition marks, biological notes and distribution being given. The attractive paintings by H. J. Slijper are a great help. The book is bilingual and well indexed."

BIRDS--POPULATIONS & FLUCTUATIONS

Bond, Gorman M., editor. NINETEENTH BREEDING-BIRD CENSUS. Aud. Field Notes 9(6): 407-432. Dec. 1955.

Quantitative studies of birds of 40 study areas distributed from Vera Cruz to Mackenzie and from Maine to Calif. As usual, forested and semiforested areas are best represented. Almost all censuses made in e. and cent. states in 1955

revealed a noticeable decrease in birdlife. "In almost every case, the birds which showed the greatest decrease in number were the small, highly migratory warblers, vireos and flycatchers... Explanations...are not immediately forthcoming, but two factors may be taken into account, both of which took place during the migration periods: the intense cold wave over the Southeast during the spring of this year and the violent hurricane season of 1954."

Monroe, Burt L., Sr. IMPRESSIONS ON CHANGES IN URBAN BIRD POPULATIONS (A FORTY-YEAR STUDY OF THE ORNITHOLOGY OF THE LOUISVILLE REGION). Ky. Warbler 31(3): 39-47. Aug. 1955.
Brief but significant discussion of changes of abundance of many types of birds in vicinity of Louisville, Ky., in last 40 years. Numerous interesting increases, declines, and changes of habits are recorded.

Turček, F. J. (For. Res. Inst., Banská Štiavnica, Czechoslovakia.) ON THE BIRD POPULATION OF THE SPRUCE FOREST COMMUNITY IN SLOVAKIA. Ibis 98(1): 24-33, graph. Jan. 1956.
Quantitative, ecological study based on work since 1947. Comparisons are made with studies in other countries.

BIRDS--CONTROL, MORTALITY

Howell, J. C. (U. Tenn.) A COMPARISON OF CEILOMETER MORTALITY AT KNOXVILLE AND NASHVILLE, TENNESSEE, IN 1951 AND 1954. Migrant 26(4): 53-57. Dec. 1955.

Mann, Wm. F., Jr., H. J. Derr, and Brooke Meanley. (S. For. Exp. Sta., New Orleans 13, La.) A BIRD REPELLENT FOR DIRECT SEEDING OF LONGLEAF PINE. J. For. 54(3): 190-191. Mar. 1956.
Another report on successes with Morkit and suggestions for use of this compound. See also WR 82: 31 and 83: 44.

Salomonsen, Finn. BIRD PRESERVATION IN GREENLAND. Dansk Ornith. Forenings Tidsskrift 49(1): 3-11. 1955. [Abstract by O. L. Austin, Jr., Bird-Banding 26(4).]
Danish with English summary. "A plea for more stringent hunting regulations and enforcement to restore and maintain the populations of several species now in danger in Greenland. The Eider, which was almost exterminated early in the century by wholesale shooting and egging, is now increasing gradually under protection given it in 1924. The Ptarmigan is also protected in summer in southwest Greenland, and new regulations were passed in 1951 protecting all geese on their breeding grounds. Most seriously threatened at present are the Arctic Tern, Puffin, Murre, and Cormorant, mostly by egging rather than by shooting. In the Grønne Islands in Disko Bay at least 100,000 Arctic Tern eggs are collected each summer, and the species has decreased considerably in recent years. Dr. Salomonsen makes specific recommendations for the protection of these four species."

BIRDS--PARASITES AND DISEASES

Mahon, June. (McGill U.) ON A COLLECTION OF AVIAN CESTODES FROM CANADA. Can. J. Zool. 34(2): 104-119, 22 figs. Apr. 1956.
Twenty species of tapeworms are recorded from some 27 species of birds, 7 of them waterfowl. Many of the worms are described and figured.

Mawson, Patricia M. (U. of Adelaide, S. Australia.) ASCAROID NEMATODES FROM CANADIAN BIRDS. Can. J. Zool. 34(1): 35-47, 27 figs. Feb. 1956.
Discusses 13 species from various birds and describes 3 new species.

GAME BIRDS—GENERAL

Guiguet, C. J. THE BIRDS OF BRITISH COLUMBIA. (4) UPLAND GAME BIRDS. B. C. Prov. Mus. Handbook no. 10. 1-47 p., illus. Oct. 1955.
Popular booklet that provides information on appearance and habits of 15 species of native and introduced gallinaceous birds and 2 species of columbids. Data on status and distribution in B. C. are given for most species. Drawings by Frank L. Beebe show ♂ and ♀ of all but a few species.

Hunt, Roy M. (Mich. Dept. Cons.) MY EXPERIENCES DURING 38 YEARS OF BREEDING AND REARING GAME BIRDS AND WILD WATERFOWL AT THE MASON STATE GAME FARM. Mich. Dept. Cons. 1-28 p., proc. Apr. 1956.
Contains a great deal of information on what the author learned about artificial propagation of pheasant, ducks (chiefly mallard and wood), Hungarian partridge, Canada goose, wild turkey, and mute swan. A little information is given on successes or failures with prairie chicken, sharp-tailed grouse, chukar, bobwhite, and various ornamental pheasants. Some of Hunt's comments on natural history and biology of species with which he has worked are of general interest.

Norris, Robert A. (535 Powderhouse Rd., Aiken, S. C.) INTRODUCTION OF EXOTIC GAME BIRDS IN GEORGIA. Oriole 21(1): 1-6, 1 fig. Mar. 1956.
Summary: "There have been attempts to introduce in Georgia no less than eight species of potential game birds. Old World species--the Hungarian Partridge, Ring-necked Pheasant, Migratory Quail, and Guinea Fowl—were all unsuccessful, as were three Middle American species—a tinamou, the Central American Curassow, and the Ocellated Turkey. The Chachalaca, like the last three species, was introduced on Sapelo Island, but this galliform bird, unlike the rest, found a niche for itself and became established on the island as a breeding bird. Climate diagrams offer partial explanation for its success. The Chachalaca was transplanted from Tamaulipas, whose climate approaches more closely that of Sapelo than do the tropical climates characterizing the curassow and the turkey. If further introductions are to be made in Georgia, it is urged that before action is taken the prospective species be examined carefully, along with their climatic needs and biotic associations, to determine whether there is likelihood of success."

Pierce, Robert A. (Rt. 2, Frankfort, Ky.) SOME THOUGHTS CONCERNING THE INTRODUCTION OF EXOTIC GAME BIRDS. Wilson Bul. 68(1): 80-82. Mar. 1956.
Chief dangers of introductions are bringing in diseases, unfavorable hybridization, crowding out native species, and upsetting ecology. "The writer is doubtful that adequate study can be made in the federal program to properly guard against these dangers; he is certain that these dangers receive little if any attention from most states, clubs or individuals." An amazing number and variety of exotic birds and mammals have been and are being liberated by individuals and clubs with little regard to consequences. "...adequate study and control of...importations is woefully lacking at state and local levels" but "the state is the key to the control...of exotics. Exotics are unlikely to be introduced...by federal agencies unless the states involved express a desire for them." Pressures may determine state action on introductions, with biologists not being conculted until too late. Importation of exotic birds and mammals will continue. The author urges that "when importations of exotics are being contemplated, the desires and advice of biologists and conservation organizations other than those directly concerned with hunting might well be given consideration by both federal and state agencies."

QUAIL

Blackwell, William P. MECHANICAL FEEDERS FOR QUAIL. Va. Wildl. 17(5): 10-11, 13, 3 figs. May 1956.
Reviews Fla. experience with feeders and tells of problems and costs encountered in several trials in Va.

QUAIL--Continued

Campbell, Howard, and Levon Lee. (N. M. Dept. Game.) NOTES ON THE SEX RATIO OF GAMBEL'S AND SCALED QUAIL IN NEW MEXICO. J. Wildl. Mgt. 20(1): 93-94. Jan. 1956.

♂♂ apparently outnumber ♀♀ in both Gambel's quail and scaled quail in N. M. Whether there is an initial difference in sex ratio was not determined, but there evidently is a sex-differential mortality that favors ♂♂, in both species, as birds grow older.--Howard Campbell.

Collins, Francis W. (Ky. Dept. Wildl. Resources.) ARTIFICIAL FEEDERS—QUAIL MANAGEMENT TECHNIQUE. Ky. Happy Hunting Ground 12(3): 29, 2 figs. May 1956.

Florida-type feeders were tested and evaluated for 82 weeks on 2 Ky. farms. Five feeders were placed on each farm. Little use by quail was observed. Feeders did not appear to hold quail on either summer or winter range. Most use of feeders was made by rodents and songbirds; these took almost all of the feed that was consumed. On one of the areas, gray squirrels were frequent visitors to the feeder. Total cost of feed was $34. Feeders had to be tended every 2 weeks. Author concludes that feeders are of value only under special conditions, as for recently released birds, under winter emergencies, or where there are isolated patches of cover and little available food.

Jennings, Bill, and Clyde Graham. (Texas Game Comm.) WATER FOR WILDLIFE. Texas Game & Fish 14(2): 16-17, 5 figs. Feb. 1956.

Photographs and their legends give data on 5 types of guzzlers that are being tried in West Texas.

Tarshis, I. Barry. (Camp Detrick, Frederick, Md.) TRAPS AND TECHNIQUES FOR TRAPPING CALIFORNIA QUAIL. Bird-Banding 27(1): 1-9, 5 figs. Jan. 1956.

Summary: "Four traps for catching California quail...are described. Methods and procedures...are discussed." A detailed and apparently very useful paper.

PHEASANTS

Allen, Durward L., editor. PHEASANTS IN NORTH AMERICA. Stackpole Co., Harrisburg, Pa., and Wildl. Mgt. Inst., Wash., D. C. xi + 490 p., 33 figs., 8? plates, 1 col. pl. 1956. $7.50.

This book is the product of 19 pheasant specialists and game administrators located throughout the pheasant range of the U. S. The bringing together of material from such varied sources, working out differences among the authors, and welding results into a coherent story of the pheasant is a tremendous accomplishment. It well exemplifies one of the functions of the Wildlife Management Institute, under whose direction the work was done. The book automatically takes its place on the "must" list of every serious wildlife research or management biologist. It begins with a chapter on pheasant biology and population problems. Seven regional accounts follow. These discuss pheasant research and management, local habitat conditions, needs of the species, and current status within regions. A final chapter, "The Management Outlook," serves both as a summary and as a discussion of management possibilities. With such diversified authorship it is unavoidable that some variation in central theme can be detected. Differences in treatment are minor, however, and the work as a whole is a modern, encyclopedic account of American pheasant research and management that could not have been produced by any one author. The book is well illustrated, with a color plate and chapter headings by Bob Hines, distribution maps, and photographs. The "Literature Cited" provides a good bibliography of important pheasant studies of the past decade or two.--F. H. Dale.

Klouch, Ralph I. (Mich. Dept. Cons.) RESULTS OF A SURVEY OF PHEASANT HUNTERS BY MAIL. Mich. Acad. Sci. 41: 99-107, 2 figs. 1956 (for 1955).

Post-card poll was made of 3,000 small-game licensees. After 6 mailings, response was 97.7% for deliverable cards. The type of survey was considered satisfactory. Probably 4 or fewer mailings would have given adequate results. Cards were sent after 1952 season and before 1953 season and requested data on both. 66% of licensees hunted pheasants in 1952, 75% in 1953. 20% and 25% of those who bought licenses 1 year did not the other. Pheasant kill averaged 2.06

per hunter in 1952 and 2.32 in 1953. Reported success declined only slightly with replies from repeated mailings. In 1953, bag averaged 0.65 pheasants per day of 3.72 hours and 5.78 gun-hours per bird. Hunters averaged 3.46 days afield during the 22-day season. It took 4.1 hours to bag a pheasant on opening day and 8.4 during last week. Of season's kill, 31% was first day, 76% in first week, 15% in second week, 9% in last week. State-wide kill was about 897,940 in 1952 and 1,226,990 in 1953. Confidence limits were estimated.

Harger, Elsworth M. (Mich. Dept. Cons., The Heights, Mich.) BEHAVIOR OF A RING-NECKED PHEASANT ON A PRAIRIE CHICKEN BOOMING GROUND. Wilson Bul. 68(1): 70-71. Mar. 1956.
Cock pheasant invaded a booming ground and drove off 3 ♂ prairie chickens. Hybridization may result from such incidents.

Scott, M. L., E. R. Holm, and R. E. Reynolds. (Cornell U.) STUDIES ON PHEASANT NUTRITION. 2. PROTEIN AND FIBER LEVELS IN DIETS FOR YOUNG PHEASANTS. Poultry Sci. 33(6): 1237-1244. Nov. 1954.

Scott, M. L., E. R. Holm, and R. E. Reynolds. (Cornell U.) STUDIES ON PHEASANT NUTRITION. 3. EFFECT OF ANTIBIOTICS, ARSENICALS AND THYROACTIVE COMPOUNDS UPON GROWTH AND FEATHERING IN PHEASANT CHICKS. Poultry Sci. 33(6): 1261-1265. Nov. 1954.

Scott, M. L., E. R. Holm, and R. E. Reynolds. (Cornell U.) EFFECT OF DIET ON THE ABILITY OF YOUNG PHEASANT CHICKS TO WITHSTAND THE STRESS OF COLD, DRENCHING RAIN. Poultry Sci. 34(4): 949-956. July 1955.

Westerskov, Kaj. THE PHEASANT IN NEW ZEALAND. N. Z. Dept. Int. Affairs, Wildl. Publ. no. 40. 1-35 p., illus. 1955.
Semipopular digest of author's doctoral thesis. Will be amplified by 3 technical bulletins (nos. 40 A, B, C). Reviews forms of P. torquatus present, distribution and relative abundance, habitats, sex and age composition, turnover, breeding, clutch size, incubation, molt, nest and brood mortality, productivity, management, pros and cons of stocking, and management suggestions. Good habitat is not common and pheasants are not abundant. Sex ratio is nearer 1:1 than in Europe and U. S. where pheasants are commoner and more heavily shot. The birds are relatively solitary and nearly monogamous. Bags consist 60-70% of young of year. Turnover is complete within 5 years. Nesting sites and mowing mortality are similar to those in U. S. Breeding season is much more extended than in U. S., owing to less seasonal climatic change. Clutches are relatively small (av. 9) but do not decline in size during the 6-7 month breeding season. Small clutches are considered adaptive to rather poor habitat conditions. Half of all observed nests hatch successfully; man is responsible for 86% of nest losses. About 40% of chicks hatched live to maturity. Broods dwindle to 3-4 rather than to 6-8 as in some U. S. areas. Productivity is low and populations are not dense even in best areas. Hunting removes 35-50% of cocks. Scarcity of birds and roughness of country limits usual bag to 1 a day; legal limit of 6 is superfluous and undesirable. Minor changes in length of season have little effect. The considerable shooting of hens is unfavorable and generally illegal. The continued and extensive stocking is costly, ineffective, and upsets evolutionary adaptation to local conditions. Recommended are habitat improvement and protection of nesting areas. Creation of managed hunting preserves near towns should be considered.

Dale.

GROUSE, PARTRIDGE, ETC.

Anon. SEÑOR RED LEGS...LATEST UTAH EMIGRANT. Utah Fish & Game Bul. 12(2): 2-3, illus. Feb. 1956.
Red-legged partridge, Alectoris rufa, from Spain stocked in Utah. [Others stocked in Colo. (Modern Game Breeding 26(2): 4, Feb. 1956) and Texas (Texas Game & Fish 14(3): 14, Mar. 1956).]

Bettmann, H. ZUR BIOLOGIE DES REBHUHNES. Wild und Hund. Hamburg. No. 25, 1955. (Pages not stated.) [From abstract in Z. Jagdwissensch. 1(2).]
Observations on the relation of young partridges (Perdix) to adults shows that at the beginning of the hunting season the young are weakly associated with adults. About 25% of the birds are adult in 2 years.—D. E. Davis.

GROUSE, PARTRIDGE, ETC.—Continued

Bohl, Wayne H. (N. M. Dept. Game.) EXPERIMENTS IN LOCATING WILD CHUKAR PARTRIDGES BY USE OF RECORDED CALLS. J. Wildl. Mgt. 20(1): 83-85. Jan. 1956.
Preliminary experiments on transmitting recorded chukar calls into the wild, to stimulate wild birds to answer, offer possibilities of checking dispersion as well as censusing the partridges.--W. H. Bohl.

Dorney, Robert S., and Helmer M. Mattison. (Wis. Cons. Dept., Ladysmith.) TRAPPING TECHNIQUES FOR RUFFED GROUSE. J. Wildl. Mgt. 20(1): 47-50, 3 figs. Jan. 1956.
Techniques for live-trapping in spring, late summer and fall, and winter are described. These include use of mirror traps, cloverleaf traps with leads, special holding cages, preferred baits, and related methods.--R. S. Dorney.

Peterle, Tony J. (Mich. Dept. Cons.) TRAPPING TECHNIQUES AND BANDING RETURNS FOR MICHIGAN SHARP-TAILED GROUSE. J. Wildl. Mgt. 20(1): 50-55, 4 figs. Jan. 1956.
(1) Four different types of traps were used during winters of 1951-52 and 1952-53 in Upper Peninsula of Mich. The tip-top was the most successful winter trap tested. (2) Buds and catkins of white birch were the most successful bait. Trapping success declined when other baits were substituted. (3) The cannon-projected net trap was the most efficient method used. Description, modifications, and techniques used for net-trapping sharptails are given. Spring trapping seems preferable in that more areas are accessible both for releasing and trapping. Spring releases in unpopulated areas may be more successful since the birds tend to restrict their movements at that time. Better results (trapping more females) with the cannon net trap might be obtained where weather conditions are more likely to permit trapping throughout the peak of the dancing period. (4) A brief summary of banding returns from sharptails trapped and banded in Mich. from 1940 to 1954 is given, together with an interpretation.--T. J. Peterle.

Seiskari, Pertti, and Jukka Koskimies. ECOLOGICAL EVIDENCE OF RACIAL DIVERGENCE IN THE CAPERCAILLIE, TETRAO UROGALLUS L., IN FINLAND. Papers on Game Res. (Helsinki) 16. 1-11, 11 figs. 1955.
Much information is given on feeding habits, winter roosting habits, clutch size, fluctuations, flocking, and sex composition of flocks. Authors believe 2 races occur in Finland but reach no taxonomic decision.

Stewart, Robert E. (Patuxent Refuge, Laurel, Md.) ECOLOGICAL STUDY OF RUFFED GROUSE BROODS IN VIRGINIA. Auk 73(1): 33-41. Jan. 1956.
Describes changes of habitat preferences of broods in Shenandoah Mtns. during May-Aug. and gives much information on changing food habits of young grouse during this period.

Sutton, George M., and David F. Parmelee. (U. Okla.) THE ROCK PTARMIGAN IN SOUTHERN BAFFIN ISLAND. Wilson Bul. 68(1): 52-62, 3 figs. Mar. 1956.
Notes on Lagopus mutus: scarcity in 1953, plumages, actions of individuals, nesting success.

Traunmüller, J. ZUSAMMENHÄNGE ZWISCHEN NIEDERSCHLÄGEN UND REBHÜHNERSTRECKE. Der Deutsche Jäger. München. No. 2, 1955. (Pages not stated.) [From abstract in Z. Jagdwissensch. 1(2).]
In a part of Austria, the deposit of sediment from 1905-1934 was compared with the deaths of partridges (Perdix). The deposits summated the weather conditions. Deaths before 1914 were 63% higher than afterward. The reason was improved food and cover.--D. E. Davis.

TURKEY

Cantner, Danford E. AN EVALUATION OF THE TECHNIQUES USED TO RESTOCK UNOCCUPIED WILD TURKEY HABITAT IN VIRGINIA. M. S. thesis, Va. Poly. Inst. 61 p. 1955.

TURKEY--Continued

McDowell, Robert D. (Box U-87, U. Conn.) PRODUCTIVITY OF THE WILD TURKEY IN VIRGINIA. Va. Comm. Game & Inland Fish., Tech. Bul. no. 1. 1-44 p., map. 1956.

Important, detailed report of statistical analyses and interpretations of production and harvest data from various portions of state. The paper represents a doctoral thesis of which author's abstract appeared in WR 77: 50. McDowell recommends that regulations be based on productivity and made for counties rather than regions, insofar as practicable.

Schleidt, Margret. STUDIES ON THE RELEASING OF GOBBLING IN THE TURKEY. Z. Tierpsych. 11(3): 417-435. 1954. [Abstract by M. M. Nice, Bird-Banding 26(4).]

In German. "Intensive observations at Buldern on wild and domestic toms. The effective sign stimuli for gobbling were found to be sounds containing frequencies between 200 and 6,000 cycles per second. The innate releasing mechanism appears to be 'everything the cock is able to hear and which, by a certain sound intensity, "contrasts with the background."' 'The gobbling of the turkey-cock is a consummatory act; it belongs to a special sub-drive of the general reproductive drive.'"

DOVES AND PIGEONS

Goodwin, Derek. NOTES ON FERAL PIGEONS. Avicultural Mag. 61(6): 190-213. 1954. [From long abstract by M. M. Nice, Bird-Banding 26(3).]

Ecology, habits, behavior, variation, origin.

Shaw, Morris H. WE'RE UNDERHARVESTING OUR DOVE CROP. Fla. Wildl. 9(11): 18-21, 34, illus. Apr. 1956.

"Relaxation of regulations is definitely indicated, tempered by intelligent caution, not old-maid timidity... On the basis of one of the most comprehensive, practical studies of the management of a game species we have yet seen, there is but one conclusion to be drawn; from the practical, wise-use standpoint, the country's nimrods are being short changed. The scientific findings of able and interested technical workers are all but being ignored. Where the dove is concerned, the nation's hunters have no choice but to shoot too little and too late."

Wight, Howard M. (Mo. Cons. Comm.) A FIELD TECHNIQUE FOR BURSAL INSPECTION OF MOURNING DOVES. J. Wildl. Mgt. 20(1): 94-95, 2 figs. Jan. 1956.

For identifying age of doves whose post-juvenal molt has progressed to the point that feather characters are no longer reliable indicators of age. Use of heavy shears to sever the tail just posterior to the vent exposes the bursa to gross examination. Probing the bursa without dissection is also possible, but is not recommended as a rapid field technique.--H. M. Wight.

WATERFOWL

Anderson, William. (Calif. Dept. Game.) A WATERFOWL NESTING STUDY ON THE GRASSLANDS, MERCED COUNTY, CALIFORNIA. Calif. Fish & Game 42(2): 117-130, 2 photos. Apr. 1956.

This 90,000-acre area in the San Joaquin Valley used to produce many ducks. Now water is diverted from it for irrigation and duck habitat is reduced. The paper reports studies made on sample plots totaling 3,800 acres. Common nesters were mallard, gadwall, and cinnamon teal. 319 duck nests were observed in 1953. Hatching occurred in 16.3%. Average hatch in successful nests was 6.2. In 1954, 427 nests were studied. Hatching occurred in only 9.4%. Average hatch was 6.3. Predation by mammals (facilitated by low water) caused loss of 61.7% of nests in 1953 and 82% in 1954. Camera sets and other evidence proved striped skunks, opossums, and raccoons were chief nest raiders. Cattle seldom trampled nests. Flooding caused loss of some nests, but other nests were built up successfully by ducks. Data are given on hatching periods and nest sites. Success of coot nests rose from 10% in 1953 to 63% in 1954. "As a means of increasing waterfowl production in the Grasslands, it is suggested that: a. Provisions be made during the nesting season to keep water on selected areas where nesting cover is adequate. b. A predator trapping program be concentrated on these selected areas."

Anon. [GEESE KILL ATTACKING EAGLE IN MID-AIR.] Idaho Wildl. Rev. 8(5): 11. Mar.-Apr. 1956.
"W. E. Wayne, Boise, witnessed an unusual occurrence when he was working on a construction job at Whittier, Alaska. He said that geese had been flying south in large numbers for days (September), when one time a bald eagle attacked a formation. Six geese detached from one end of the V and attacked the eagle, flogging it with their wings. The eagle fell to the beach and was dead when the workmen who saw the action got over to where he fell." Copied completely. [An experienced waterfowl biologist considers this account difficult to accept.]

Atwood, Earl L. (Patuxent Refuge, Laurel, Md.) VALIDITY OF MAIL SURVEY DATA ON BAGGED WATERFOWL. J. Wildl. Mgt. 20(1): 1-16, 4 figs. Jan. 1956.
The true season bag of waterfowl from 4 public hunting areas was used as a control to determine validity of respondents' reports from a post-season mail contact of all hunters using the areas. The investigation was carried out during 1951-52 and 1952-53 hunting seasons. Responses equivalent to 65% after 2 contacts and 78% after 3 contacts, at 21 day intervals, were obtained from 13,314 waterfowl hunters. Examination of the distributions of the true seasonal bag frequency revealed several relationships and characteristics which led to recognition and evaluation of the mail survey errors. Large response-bias errors identified as prestige, type I and type II memory-bias were found to occur in the response data. The degree of error in most cases reduced the reliability of the data below practicable usefulness. Knowledge of the pattern of occurrence and characteristics of response errors obtained during the investigation was used to develop a two-step method for removing the effect of the response-bias errors. The application of this method increased reliability up to the approximate limits of the sampling errors.--E. L. Atwood.

Barraclough, Mary E. BIOLOGY OF CANADA GEESE (BRANTA CANADENSIS MOFFITTI) IN THE FLATHEAD VALLEY OF MONTANA. M. S. thesis, Mont. State U. viii + 91 p., 5 figs., 3 plates, proc. Aug. 1954.
Size of breeding population (about 1/2 of total population), nesting biology, nesting success (73% in 1953, 51% in 1954), causes of failures (weather, disturbance by man, crows), renesting (by about 30% of unsuccessful pairs), clutch size (2-10, av. 5-6), relationship of clutch size to various factors, hatching success (about 5 in successful nests, av. of 3.5 over-all in 1953 and 2.2 in 1954), travels of young soon after hatching (2-10 miles), combined broods, gosling mortality (0-25%, depending on local conditions), movements of flocks during hunting season and their relation to hunting pressure, hunting statistics (cripple loss about 33%), composition of bags (56% juveniles), band recoveries (20.6% in first year and 33.6% for geese banded in 1 area), overwintering in area (winter losses seemed low), status of population (level or increasing a bit), management recommendations for area.

Breckenridge, W. J. (U. Minn.) NESTING STUDY OF WOOD DUCKS. J. Wildl. Mgt. 20(1): 16-21, 8 figs. Jan. 1956.
Report of mechanically recorded time ?? spent on and off nests, of temperature fluctuations in nests, and of incubation periods. Incubation varied with amount of incubation by ? and hence with temperatures in nest. Author suggests that "the shortest incubation period for any species approaches most nearly the period characteristic of the species since any temperature rise above normal will not shorten the period, but severe chilling can greatly increase the incubation period."

Cooch, Graham. (Can. Wildl. Serv., Ottawa.) RING-NECKED DUCK (AYTHYA COLLARIS), BREEDING IN SAGUENAY COUNTY, QUEBEC. Can. Field-Nat. 69(3): 130. July-Sept. 1955.
"...in recent years the species has greatly expanded its range in the northeast."

Curth, P. DER MITTELSÄGER. A. Ziemsen Verlag (Wittenberg Lutherstadt). 102 p., illus. 1954. [From Auk 73(1).]
"A study of Mergus serrator in Europe, which deals with the subjects of migration, flocking, locomotion, display and breeding biology. Most of the behavior described is illustrated by a fine series of photographs."

Farley, John L. (US F&WS.) DUCK STAMPS AND WILDLIFE REFUGES. US F&WS, Cir. 37. 1-22 p., illus. 1955. 20¢ from Supt. Documents.
Interestingly written pamphlet that traces development of refuge program and tells convincingly about costs of acquisitions and improvements. Costs of land, supplies, and equipment have risen rapidly and little money other than that from duck stamps has been available. Future needs of lands for waterfowl are discussed; finances needed are contrasted with those available. Role of states in acquiring and managing waterfowl lands is reviewed. Appendix shows expenditures by Branch of Wildlife Refuges, 1935-55; acreage of refuge lands under jurisdiction of F&WS, 1903-1953; and acreages of federal waterfowl refuges, which are listed by states.

Farmes, Robert E. (Minn. Dept. Cons., Thief Riv. Falls.) POTHOLES OF MAHNOMEN COUNTY. Flicker 28(1): 24-30. Mar. 1956.
Waterfowl productivity of 15 potholes in one of the best remaining breeding areas of Minn. Data were gathered 1950-52. Potholes are described individually and tables show waterfowl use and productivity (by species) of each. "...a minimum of 108 breeding pairs was estimated to have used 15 potholes during the study period. This is an average of 2.6 breeding pairs per pothole per year; or on an acreage basis, the 22.1-acre study area supported an average duck breeding population of 1.6 pairs per acre... ...it is estimated that the 15 potholes contributed to the production of 52 duck broods totaling 422 young. This is reasonable in view of the fact that 108 breeding pairs used the area. This is an average production of approximately seven ducks per acre per year." Potholes of this sort are being drained at a terrific rate; 10 of the 15 studied are scheduled for drainage. Some Minn. marshes have had almost all local birds shot and now have few if any ducks returning to them. The cure is later opening of hunting.

Farr, Marion M. (USDA.) THREE NEW SPECIES OF COCCIDIA FROM THE CANADA GOOSE, BRANTA CANADENSIS (LINNÉ 1758). J. Wash. Acad. Sci. 43(10): 336-340, 4 figs. Oct. 1953.

Gates, John M., and James R. Beer. (Utah State Coll. & U. Minn.) A MARSH BIRD STUDY—SPRING 1955. Flicker 28(1): 16-21, map. Mar. 1956.
Study of migration dates of birds and productivity of 3.5-acre pothole at St. Paul, Minn. Data are given on breeding of mallard, blue-winged teal, pied-bill grebe, and red-winged blackbird. All 3 pairs of mallards brought off broods. Some of the 6 pairs of teal also had broods. By June there were 60 ducklings of both species on the marsh, but some of them may have come in from elsewhere. Notes are given on breeding activities of the ducks.

Glover, Fred A. (US F&WS.) NESTING AND PRODUCTION OF THE BLUE-WINGED TEAL (ANAS DISCORS LINNAEUS) IN NORTHWEST IOWA. J. Wildl. Mgt. 20(1): 28-46, 14 figs. Jan. 1956.
Objectives were: (a) to develop a method of determining annual production prior to hunting, (b) to compare past and present production, (c) to analyze some factors affecting waterfowl production, and (d) to recommend management procedures. Nesting, nests, and eggs are described. Annual production figures were obtained from data on nest densities, nest success and brood counts. In 1948 the calculated number of juveniles produced per breeding pair was 1.33 and in 1949, 1.35. Comparison of 1948 and 1949 production with 1932-36 and 1946 indicated a decline in number of juveniles produced per breeding pair. Nests located in cover of light to sparse stem density and light intensity ratings of less than 10 per cent were more successful than those in other covers utilized. Detrimental effects of burning were reflected by nesting populations as much as a year after the fire. Predation was responsible for the loss of 100 of 186 nests. Recommended management includes: (1) protecting margin of cover around water areas, (2) removing dominant weedy vegetation, (3) maintaining present nesting areas, and (4) educating youth of area in predator trapping techniques and better fur utilization.—F. A. Glover.

Hanson, H. C., N. D. Levine, and Sidney Kantor. (Ill. Nat. Hist. Surv., Urbana.) FILARIAE IN A WINTERING FLOCK OF CANADA GEESE. J. Wildl. Mgt. 20(1): 89-92. Jan. 1956.

Summary: "Microfilariae of Ornithofilaria (?) sp. were found in the blood of 153 juvenile Canada geese, 21.4% of 42 yearlings and 11.7% of 111 adults at Horseshoe Lake Game Refuge, Illinois in the winter of 1953-54. Microfilariae of Sarconema eurycerca were found in none of the juveniles, 9.5% of the yearlings and 4.5% of the adults. The microfilaria of S. eurycerca was found to have a sheath, and that of Ornithofilaria (?) sp. to have a protrusible oral stylet. The microfilariae of S. eurycerca survived 38 days in serum at 5°C., while those of Ornithofilaria survived up to 34 days at 5°C. and 7 days at room temperature."

Jenni, Donald A. POTHOLE WATER LEVELS IN RELATION TO WATERFOWL BREEDING POPULATIONS AND PRODUCTION. M. S. thesis, Utah State Agr. Coll. vii + 55 p., 12 figs. 1956. [Copy in US Dept. Int. Library.]

Study was made in Day Co., S. Dak., 1954, following 4 years of work by others. The smaller, less permanent potholes were important for use of breeding pairs and the larger, more permanent potholes were vital for rearing broods. Smaller potholes are the ones most often and most easily drained. Their loss results in greatly decreased breeding. Drainage of the large potholes has even more drastic effects. "Productivity, relative brood rearing success, of the various populations averaged 36 percent for all species for the five-year period. There was considerable variation between years for any one species and between species during any one year. The variations in productivity could not be related to any natural phenomenon." Also discussed is relative use of different types of potholes in wet and dry years.

Mörzer, Bruijns, M. F. THE BRENT GOOSE, BRANTA BERNICLA (L.), ON TERSCHELLING. Ardea 43(4): 261-271, map. 1955.

In Dutch with long English summary. The brent has decreased by at least 2/3 in the Netherlands since 1932 because eelgrass has died out completely along the coast. Recent censuses on Terschelling are tabulated. Abundance, habitats, and food habits are described by seasons of year. Aside from seasonal habitat shifts, little travel from area to area is noted.

Stewart, Robert E., and John W. Aldrich. (Patuxent Refuge, Laurel, Md.) DISTINCTION OF MARITIME AND PRAIRIE POPULATIONS OF BLUE-WINGED TEAL. Proc. Biol. Soc. Wash. 69: 29-34. May 1956.

Describes Anas discors orphna, a new dark race that breeds in salt or brackish tidal marshes along Atlantic seaboard from ne. N. C. n. to ne. Mass. and in N. B., N. S., and Prince Edward Id. Many localities are listed for this and the typical race. Taxonomy and intergrades are discussed.

U. S. Fish & Wildlife Service and Canadian Wildlife Service. WATERFOWL POPULATIONS AND BREEDING CONDITIONS SUMMER 1955. US F&WS, Spec. Sci. Rep.-Wildl. no. 30. v + 267 p., maps & graphs. Feb. 1956.

Annual report of field studies on which waterfowl regulations are based. It consists of 44 separate reports that deal with many areas. These reports were written by and are credited to numerous workers in state, U. S., and Canadian governments and other organizations. Data pertain chiefly to methods, water conditions, waterfowl populations, production in sample areas, and banding. Numerous tables provide great amounts of data. Most reports are individually summarized.

CRANES, RAILS, SHOREBIRDS

Murphy, Robert Cushman. (Am. Mus. Nat. Hist., N. Y.) BIRD-NETTING AS A TECHNIQUE FOR BANDING SHORE-BIRDS. Bird-Banding 26(4): 159-161, 2 figs. Oct. 1955.

Method used in Philippines for capture for market. "The birds spend the night in groups around such wet places as rice fields and they become so somnolent that they are not easily alarmed. The fowlers find their prey by means of the flashlights, which do not disturb the birds. They can approach quietly and bring down the nets over an entire huddle." Both long-handled nets and throw nets with weighted edges are used.

CRANES, RAILS, SHOREBIRDS--Continued

U. S. & Canadian Wildlife Services. INVESTIGATIONS OF WOODCOCK, SNIPE, AND RAILS IN 1955. US F&WS, Spec. Sci. Rep.: Wildl. no. 31. ii + 54 p., 2 maps, 5 figs. Jan. 1956.

Eleven papers comprise annual progress report of cooperative studies. Papers and authors are: Summary of woodcock, snipe and rail investigations for 1955, by John W. Aldrich. A method of measuring wintering woodcock populations on nocturnal feeding sites in Louisiana, by Leslie L. Glasgow. Wintering woodcock populations in West-Central Louisiana, 1954-55, by Vincent H. Reid and Phil Goodrum. Woodcock singing ground counts in Canada - 1955, by V. E. F. Solman. Woodcock census studies in Northeastern United States - 1955, by Howard L. Mendall. Woodcock singing ground counts for the Middle Eastern States, 1955, by P. F. English. Woodcock singing ground counts in the Central-Northern United States - 1955, by John W. Aldrich. Massachusetts woodcock studies - 1955, by William G. Sheldon. Cover requirements of breeding woodcock in Central Maine, by Robert B. Weeden. The juvenal plumage of the American Woodcock, by Allen J. Duvall. Wilson's snipe wintering ground studies, 1954-55, by Chandler S. Robbins.

Weeden, Robert Barton. COVER REQUIREMENTS OF BREEDING WOODCOCK IN CENTRAL MAINE. M. S. thesis, U. Me. v + 107 p., illus. 1955. [Copy in US Dept. Int. Library.]

Westfall, Claude Z. A STUDY OF WOODCOCK BEHAVIOR ON THEIR BREEDING GROUNDS IN CENTRAL MAINE. M. S. thesis, U. Me. v + 117 p., illus. 1954. [Copy in US Dept. Int. Library.]

OTHER BIRDS

Armstrong, Edward A. THE WREN. Collins, London. 312 p., illus. 1955. Available from Macmillan, N. Y. $6.00. [From review by Monica de la Salle, Aud. Mag. 57(5).]

"As could be expected from the author of 'Bird Display and Behavior,' this important monograph on the European wren--the species corresponding to our winter wren--includes much comparative data on bird behavior. The result of many years of study, it covers distribution, habitat, migration, nesting, and general habits. ...a fine and authoritative work..."

Breckenridge, W. J. (U. Minn. Mus. Nat. Hist.) MEASUREMENT OF THE HABITAT NICHE OF THE LEAST FLYCATCHER. Wilson Bul. 68(1): 47-51, map. Mar. 1956.

"Examination of the varying conditions in this habitat finally suggested that the real limiting factor was the degree of openness just beneath the forest crown; in other words, the abundance and distribution of limbs intersecting the zone of use of the flycatchers (8 to 30 feet in height) beneath the leafy forest canopy." Method of measuring this factor is described. Population density of the species appears to depend on this factor.

Curry-Lindahl, Kai. ON THE OCCURRENCE OF THE EAGLE OWL, BUBO BUBO (L.), IN SWEDEN AND SOME DETAILS OF ITS BIOLOGY. Vår Fågelvärld 9(3): 113-165, illus. 1950.

In Swedish with long English summary. A major paper on status and habits of European great horned owl. Discusses numbers and status in all parts of Europe, with special detail for Sweden, reviews causes of recent great decline (chiefly persecution, disturbance, and habitat destruction by man), ecology, reproduction, and food habits. In some parts of Europe the bird is exterminated and in many other parts the few pairs that remain can be enumerated. Four breeding pairs are known in Hungary, for example. The situation is so serious that known breeding localities in Sweden are kept secret. Compilation of food-habits information presented here indicates that the eagle owl is more beneficial than harmful, on the average.

Dilger, William Christopher. ECOLOGICAL ISOLATING MECHANISMS, REPRODUCTIVE ISOLATING MECHANISMS AND RELATIONSHIPS OF THE AVIAN GENERA HYLOCICHLA AND CATHARUS. Ph. D. thesis, Cornell U. 145 p. 1955. [From abstract in Dissertation Abstracts 16(2).]

Species involved are veery and hermit, wood, olive-backed, and grey-cheeked thrushes. Classification is discussed and altered. Habitat preferences are analyzed. Habitats differ slightly and 2 species apparently are becoming more arboreal under competitive pressure. The birds recognize their own species by voice, not by appearance. Displays, differences in habitat, and some differential in breeding time probably also help to minimize chances of hybridization.

Gordon, Seton. THE GOLDEN EAGLE: KING OF BIRDS. Collins, London. Citadel Press, N. Y. ix + 246 p., 17 photos, map. 1955. $5.00. [From reviews by "B. C.," Ibis 98(1), and E. T. Gilliard, Nat. Hist. 65(4).]

An important, narrative account with much new information. It is written on a world basis, with emphasis on detailed observations by author and others in Britain. Among topics discussed are history, distribution, present status in various countries, use in falconry, flight, foods, lifting power, enemies, longevity, weight, habits, reproduction, and persecution. The chief food is hares and rabbits, but larger animals, including sheep and game, are eaten occasionally. Man consequently has warred against this eagle so effectively that it has vanished from many European countries despite belated protection. About 40-50 pairs remain in Switzerland and 50-60 in Sweden. Thousands have been killed in the U. S. and the bird is now generally scarce. Conservation is unlikely until the species is about gone. The Swiss of the Canton of Bern not only protect the eagle but pay for any verified damage it does. This system might prove no more costly than control work in U. S. and would at least put control in official hands, as Gilliard points out.

Graber, Richard Rex. TAXONOMIC AND ADAPTIVE FEATURES OF THE JUVENAL PLUMAGE IN NORTH AMERICAN SPARROWS. Ph. D. thesis, U. Okla. 295 p. 1955. [From abstract in Dissertation Abstracts 16(1).]

Johnston, David W. (MVZ, U. Calif., Berkeley.) THE ANNUAL REPRODUCTIVE CYCLE OF THE CALIFORNIA GULL. I. CRITERIA OF AGE AND THE TESTIS CYCLE. Condor 58(2): 134-162, 7 figs. Mar.-Apr. 1956.

Important and detailed paper on changes in various parts of body with age and changes in condition and cytology of testis. The work is well integrated with data from literature.

Kendeigh, S. Charles, Theodore C. Kramer, and Frances Hamerstrom. (U. Ill.) VARIATIONS IN EGG CHARACTERISTICS OF THE HOUSE WREN. Auk 73(1): 42-65, 2 figs. + 2 plates. Jan. 1956.

Detailed study of variations of eggs with order of laying, with size of clutch, with age of mother, and of variation between eggs laid by different females. Indeterminism of laying is also treated. "The hypothesis is developed that the physical characteristics of the egg are influenced in an important manner by the energy resources of the bird during the three days immediately preceding laying."

Kramer, V. HABICHT UND SPERBER. A. Ziemsen Verlag, Wittenberg Lutherstadt, Germany. 100 p., 36 figs. 1955. DM 3.75. [From review by D. W. S., Ibis 98(1).]

Book on European sparrow-hawk and goshawk. "All aspects of their biology are dealt with, but the main emphasis is on their food and feeding habits. Detailed lists are given of the prey taken in the breeding season and in the winter, and they are compared with those given by Uttendörfer."

März, Rob. MORE MATERIAL ON FOOD HABITS OF THE EAGLE-OWL. Die Vogelwelt 75(5): 181-188. 1954. [From abstract by Frances Hamerstrom, Bird-Banding 26(3).]

In German. After reviewing data, "März concluded that the basic food of the Eagle-Owl [Bubo bubo], especially for successful rearing of young, is medium-sized prey... Too high a proportion of small prey items (mice or amphibians) is a symptom of famine. A highly varied food list, rather than the selection of a chief prey species, is also considered a portent of poor Eagle-Owl reproduction."

OTHER BIRDS--Continued

Nero, Robert W. (Sask. Nat. Hist. Mus., Regina.) A BEHAVIOR STUDY OF THE RED-WINGED BLACKBIRD. I. MATING AND NESTING ACTIVITIES. Wilson Bul. 68(1): 4-37, 4 figs., 1 pl. Mar. 1956.
Detailed account of behavior associated with reproduction.

Rand, A. L. (Chicago Nat. Hist. Mus., Chi. 5, Ill.) CHANGES IN ENGLISH SPARROW POPULATION DENSITIES. Wilson Bul. 68(1): 69-70. Mar. 1956.
With the passing of the horse, English sparrows are becoming scarce in cities although pigeons still thrive there. Sparrows are now most common around certain hog and chicken farms where types of food used are attractive to them.

Rand, A. L. (Chi. Nat. Hist. Mus., Chicago 5, Ill.) FOOT-STIRRING AS A FEEDING HABIT OF WOOD IBIS AND OTHER BIRDS. Am. Midl. Nat. 55(1): 96-100. Jan. 1956.

von Haartman, Lars. THE PIED FLYCATCHER. III. FEEDING BIOLOGY. Acta Zool. Fennica 83: 1-96. 1954. [From long abstract by M. M. Nice, Bird-Banding 26(3).]
In German. "...a most valuable, scholarly piece of work, packed with important findings and comparisons." "The four chapters in this distinguished monograph are devoted to Food, Feeding of the Young, Weight, and Evolution of Size of Brood."

REPTILES AND AMPHIBIANS

Anon. COMMERCIAL POSSIBILITIES AND LIMITATIONS IN FROG RAISING. US F&WS, Fishery Leafl. 436. 1-4 p. Apr. 1956.
Points out that artificial propagation on a commercial basis has not proved profitable and gives information for those who wish to try raising frogs. Tells what types of ponds are suitable, how to keep out predators, how frog food is supplied in Japan, what frogs are economically important in U. S., how to recognize and collect bullfrog eggs, how to ship living frogs, etc.

Blair, W. Frank. (U. Texas.) CALL DIFFERENCE AS AN ISOLATION MECHANISM IN SOUTHWESTERN TOADS (GENUS BUFO). Texas J. Sci. 8(1): 87-106, 5 figs. Mar. 1956.
Calls of 13 species were studied electronically.

Bundy, Roy Elton. COLOR VARIATION IN TWO SPECIES OF LIZARDS (PHRYNOSOMA MODESTUM AND HOLBROOKIA MACULATA SUBSPECIES). Ph. D. thesis, U. Wis. 126 p. 1955. [From long abstract in Dissertation Abstracts 15(12).]
Experiments indicated that individuals have little ability to change color and hence that their colors are probably determined genetically rather than environmentally. Colors of P. modestum and H. m. ruthveni were found to be correlated with soil color, but such correlation was lacking for 2 other races of H. maculata.

Carr, Archie, and Coleman J. Goin. (U. Fla.) THE REPTILES, AMPHIBIANS, AND FRESH-WATER FISHES OF FLORIDA. U. Fla. Press. 341 p., illus. 1955. $7.50, cloth; $6.50, paper. [From Fla. Wildl. 9(11).]
"...a volume of interest and value to the layman as well as to the serious student... The book furnishes the means of identifying quickly any of these animals, any fish, frog, salamander, snake, turtle, lizard, crocodile, or alligator that he might come across. There are keys to all the species plus carefully prepared separate accounts giving a succinct description and statement of the range and habitat of each animal. In addition to Esther Coogle's fine drawings of fishes, there is an abundance of excellent photographs by Roger and Isabelle Conant of reptiles and amphibians. There are diagrams and glossaries to explain the relatively small number of specialized terms used."

Cunningham, John D., and Don P. Mullally. (U. Calif., Los Angeles.) THERMAL FACTORS IN THE ECOLOGY OF THE PACIFIC TREEFROG. Herpetologica 12(1): 68-79. Mar. 1956.

Edgren, Richard A. (G. D. Searle Co., P. O. Box 5110, Chicago 80, Ill.) EGG SIZE IN THE MUSK TURTLE, STERNOTHERUS ODORATUS LATREILLE. Chi. Acad. Sci., Nat. Hist. Misc. no. 152: 1-3. Apr. 1956.
Demonstrates that the brittle-shelled eggs of this turtle do not differ significantly in size during the period from shortly before laying until hatching.

Funderburg, John B., Jr. (N. C. State Coll.) THE AMPHIBIANS OF NEW HANOVER COUNTY, NORTH CAROLINA. J. Elisha Mitchell Sci. Soc. 71(1): 19-28. May 1955.

Highton, Richard. (U. Fla.) SYSTEMATICS AND VARIATION OF THE ENDEMIC FLORIDA SNAKE GENUS STILOSOMA. Bul. Fla. State Mus. (Gainesville), Biol. Sci. 1(2): 73-96, 3 figs. Mar. 1956.
Variation is analyzed, 3 well-defined subspecies (2 new) are recognized in the small range of this monotypic genus, and ecology of the snake is reviewed. Interesting example of microgeographic raciation in a relict form.

Hutton, Kenneth Earl. VARIATIONS IN THE BLOOD-CHEMISTRY OF TURTLES UNDER ACTIVE AND HIBERNATING CONDITIONS. Ph. D. thesis, Purdue U. 55 p. 1955. [From abstract in Dissertation Abstracts 16(1).]
Species studied were Terrapene carolina and Pseudemys scripta.

Jameson, D. L. (U. Ore.) EVOLUTIONARY TRENDS IN THE COURTSHIP AND MATING BEHAVIOR OF SALIENTIA. Syst. Zool. 4(3): 105-119. Sept. 1955.
Review paper. Discusses subject by families of frogs and follows with general discussion. Bibliography of 2.5 pages.

Jameson, David L. (U. Ore.) GROWTH, DISPERSAL AND SURVIVAL OF THE PACIFIC TREE FROG. Copeia 1956(1): 25-29. Feb. 1956.

Jameson, David L. (U. Ore.) SURVIVAL OF SOME CENTRAL TEXAS FROGS UNDER NATURAL CONDITIONS. Copeia 1956(1): 55-57. Feb. 1956.

Kaplan, Harold M., and George T. Crouse. (S. Ill. U.) BOOOD CHANGES UNDERLYING THE SEASONAL RESISTANCE OF FROGS TO DISEASE. Copeia 1956(1): 52-54, 2 figs. Feb. 1956.

Lowe, Charles H., Jr. (U. Ariz.) A NEW SPECIES AND A NEW SUBSPECIES OF WHIPTAILED LIZARDS (GENUS CNEMIDOPHORUS) OF THE INLAND SOUTHWEST. Bul. Chi. Acad. Sci. 10(9): 137-150, 4 figs. Apr. 1956.

Martof, Bernard S. (U. Ga.) AMPHIBIANS AND REPTILES OF GEORGIA / A GUIDE. U. Ga. Press. viii + 94 p., 58 figs. 1956. $2.00, paper.
"This guide is the first comprehensive account of the herpetofauna of Georgia. It includes some new state records along with many clarifications--both extensions and reductions--of the ranges of species previously known to occur in Georgia. Furthermore, for some of the animals, new and more applicable distinguishing characteristics are revealed." The bulk of the booklet consists of a key that has occasional illustrations and is as simple as is consistent with good identification. The key gives distribution in state for species and subspecies. Scientific name and a selected common name are also given for each. Brief sections on snake-bite and preservation of specimens are followed by a checklist in which each named form is listed in systematic order with indication of general abundance, habitats, and range in state. A glossary and a list of general references complete the work.

Martof, Bernard. (U. Ga.) GROWTH AND DEVELOPMENT OF THE GREEN FROG, RANA CLAMITANS, UNDER NATURAL CONDITIONS. Am. Midl. Nat. 55(1): 101-117, 5 figs. Jan. 1956.
Much information is given on growth and sexual dimorphism in s. Mich. "Contrary to published accounts, the larval life of green frogs was found to be as short as 70 to 85 days or as long as 335 to 360 days depending on when the eggs were laid. Those deposited before about June 25 developed into metamorphosed frogs later the same year; those laid after about July 10 did not develop beyond the tadpole stage until the following year. Eggs laid between

June 25 and July 10 may or may not develop into frogs in the same season... Sexual maturity is attained about a year after transformation, but generally these recently matured frogs do not become sexually active until the following year." "The season of growth...is primarily from mid-May to mid-September, with most of it in June and July. Analysis showed it to be closely correlated with the mean monthly temperature and the number of hours that the temperature was favorable for feeding, i.e., above 60°F."

Minton, Sherman A., Jr. (Ind. U. Med. Center, Indianapolis.) POLYVALENT ANTIVENIN IN THE TREATMENT OF EXPERIMENTAL SNAKE VENOM POISONING. Am. J. Tropical Med. & Hygiene 3(6): 1077-1082. Nov. 1954.

Our standard Am. antivenin was tested on mice injected with 2 LD_{50} of venom and then with 0.1 ml. of antivenin. Significant protection was afforded against venoms of Crotalus v. helleri and Crotalus cerastes; questionable protection against Crotalus horridus and Sistrurus catenatus; no protection against either e. or w. diamondback or either of our moccasins. [Our snake-bite problem is chiefly with diamondbacks and moccasins. However, results with mice may not be just like those with people.]

Mullally, Don P., and John D. Cunningham. (San Mateo Jr. Mus., San Mateo, Calif.) ASPECTS OF THE THERMAL ECOLOGY OF THE YOSEMITE TOAD. Herpetologica 12(1): 57-67, graph. Mar. 1956.

Reed, Clyde F. INDEX TO COPEIA / 1913-1954. PART I--AUTHOR INDEX. 106 p. 1955. PART II--SUBJECT INDEX. iii + 332 p. 1956. Publ. by and available from author, 10105 Harford Rd., Baltimore 34, Md. Each part $4.00, paper.

Dr. Reed has met a long-felt want and he has done so without help. Both author and subject indexes are divided into herpetological and ichthyological sections. Author index provides full titles and citations of articles, which makes it unusually useful. Subject index has 3 divisions under both herp. and ichth.: species index, geographic index, and special subject index. Of these, the species index is the best, with 151 p. for herp. Not only is each species and subspecies listed, but author and general subject are indicated for each entry, as in following sample: VIRGINIA VALERIAE VALERIAE Baird &
Girard--Eastern ground snake.
Dunn 1915, No. 18: 6; No. 25: 63 (Va.)
. . . . . .
Schmidt 1932(1): 7 (food of coral snake)
The species index thus is detailed and exceedingly useful. The geographic index, with 5 p. for herp., is surprisingly brief and must be limited to faunal papers, new state records, and the like. The special subject index, with 8 p. for herp., is limited to certain topics such as albinism, caves, coloration, eyes, fangs, locomotion, longevity, sperm storage, etc. This portion of the index seems to be somewhat weak. It has no headings for home ranges or populations, for example, and one does not find the paper by T. P. Haines on delayed fertilization in Leptodeira indexed under either "continued fertility" or "sperm storage." Other examples of inadequate subject indexing were noted. General subjects are the bugbear of indexers, however, for things cannot be indexed in every possible way. The apparent excellence of the author and species indexes goes a long way to make up for deficiencies in geographic and subject indexes. The index as a whole is heartily recommended to all owners of runs of Copeia.

Schmidt, Karl P. (Chicago Nat. Hist. Mus., Chi. 5, Ill.) HERPETOLOGY. In A Century of Progress in the Natural Sciences 1853-1953. Calif. Acad. Sci. p. 591-627, illus. 1955.

Probably the best history of herpetology that has been written.

Schöttler, W. H. A. (Inst. Butantan, São Paulo, Brazil.) ANTIHISTAMINE, ACTH, CORTISONE, HYDRO-CORTISONE AND ANESTHETICS IN SNAKE BITE. Am. J. Tropical Med. & Hygiene 3(6): 1083-1091. Nov. 1954.

Tests with Crotalus terrificus and Bothrops jararaca venoms in mice. "The statistical analysis of the results supplied no evidence of a beneficial effect of any of these substances. Higher sublethal doses of the antihistaminic enhanced the toxicity of jararaca venom for mice. None of the tested drugs is apt to replace antivenin in snake bite treatment and the use of antihistamine is even strongly contraindicated. The significance of these findings is discussed."

Smith, Hobart M. (U. Ill.) HANDBOOK OF AMPHIBIANS AND REPTILES OF KANSAS. 2d ed. U. Kans. Mus. Nat. Hist., Misc. Publ. no. 9. 1-356 p., 253 figs. Apr. 1956. $1.50 paper; $4.00 cloth.

Large parts of this edition are identical with the first edition (1950), but numerous changes have been made in names and ranges. Some maps have been changed to reflect recent taxonomic work and range extensions. Some new photos have been added and some poor ones have been replaced. A few species have been added to or deleted from the state list. The book is an extremely useful handbook for semitechnical work; it contains all the many valuable features of the first edition (see WR 62: 50). Unfortunately, the section on treating snake bite has not been revised. Also, maps for Rana sylvatica and Gastrophryne carolinensis are interchanged and the general map for Pituophis melanoleucas has not been altered to include the range of the e. races.

Snyder, Richard C. (U. of Wash.) COMPARATIVE FEATURES OF THE LIFE HISTORIES OF AMBYSTOMA GRACILE (BAIRD) FROM POPULATIONS AT LOW AND HIGH ALTITUDES. Copeia 1956(1): 41-50, 1 fig. + 3 plates. Feb. 1956.

Thurow, Gordon Ray. TAXONOMIC AND ECOLOGICAL STUDIES ON THE ZIG-ZAG SALAMANDER (PLETHODON DORSALIS) AND THE RED-BACKED SALAMANDER (PLETHODON CINEREUS). Ph. D. thesis, Ind. U. 259 p. 1955. [From long abstract in Dissertation Abstracts 15(12).]

Relationships, habitats, evolutionary history, and correlation of distribution of color phases of cinereus with glacial history and with Sewall Wright effect.

Uzzell, Thomas M., Jr., and Albert Schwartz. (Charleston Mus., S. C.) THE STATUS OF THE TURTLE KINOSTERNON BAURI PALMARUM STEJNEGER WITH NOTES ON VARIATION IN THE SPECIES. J. Elisha Mitchell Sci. Soc. 71(1): 28-35, map. May 1955.

Willis, Yuell L., Don L. Moyle, and Thomas S. Baskett. (U. Mo.) EMERGENCE, BREEDING, HIBERNATION, MOVEMENTS AND TRANSFORMATION OF THE BULLFROG, RANA CATESBEIANA, IN MISSOURI. Copeia 1956(1): 30-41, 6 figs. Feb. 1956.

Detailed report of 4 years of study. Topics treated include: emergence and calling in relation to weather, time of breeding, stages of breeding readiness, seasonal development of gonads, size at sexual maturity, hibernation, travels and dispersal, growth and transformation of tadpoles.

Zweifel, Richard G. (Am. Mus. Nat. Hist., N. Y.) ECOLOGY, DISTRIBUTION, AND SYSTEMATICS OF FROGS OF THE RANA BOYLEI GROUP. U. Calif. Publ. Zool. 54(4): 207-292, 28 figs., 7 plates. Dec. 1955. $1.25.

Another impressive piece of work from the MVZ. Species involved are boylei, muscosa, tarahumarae, pustulosa, pueblae (sp. nov.), and moorei. Topics considered include identification, comparisons, eggs, tadpoles, food habits, habitats, temperature relationships, breeding and crossing experiments, distributional history, and phylogeny.

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Manuscript for this issue completed June 13, 1956.

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